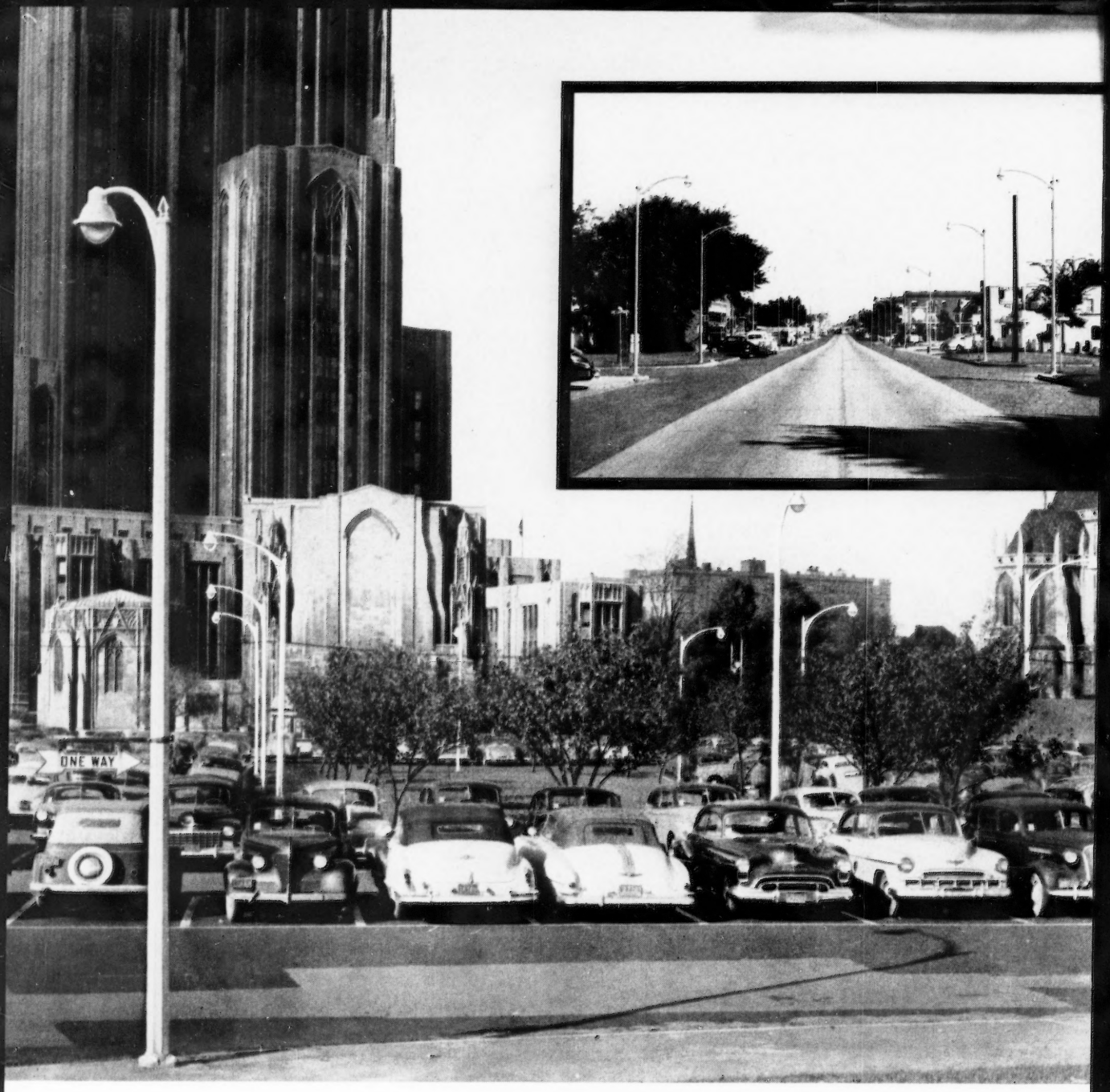
MAY, 1954

Traffic Engineering

New Jersey's New Garden State Parkway Features Barrier Type Toll System

- **Barrier System Toll Roads — Their Merits**
- **Attendant-Parking vs. Self-Parking**
- **Proposed Revisions of the Uniform Manual**

Official Publication of the Institute of Traffic Engineers



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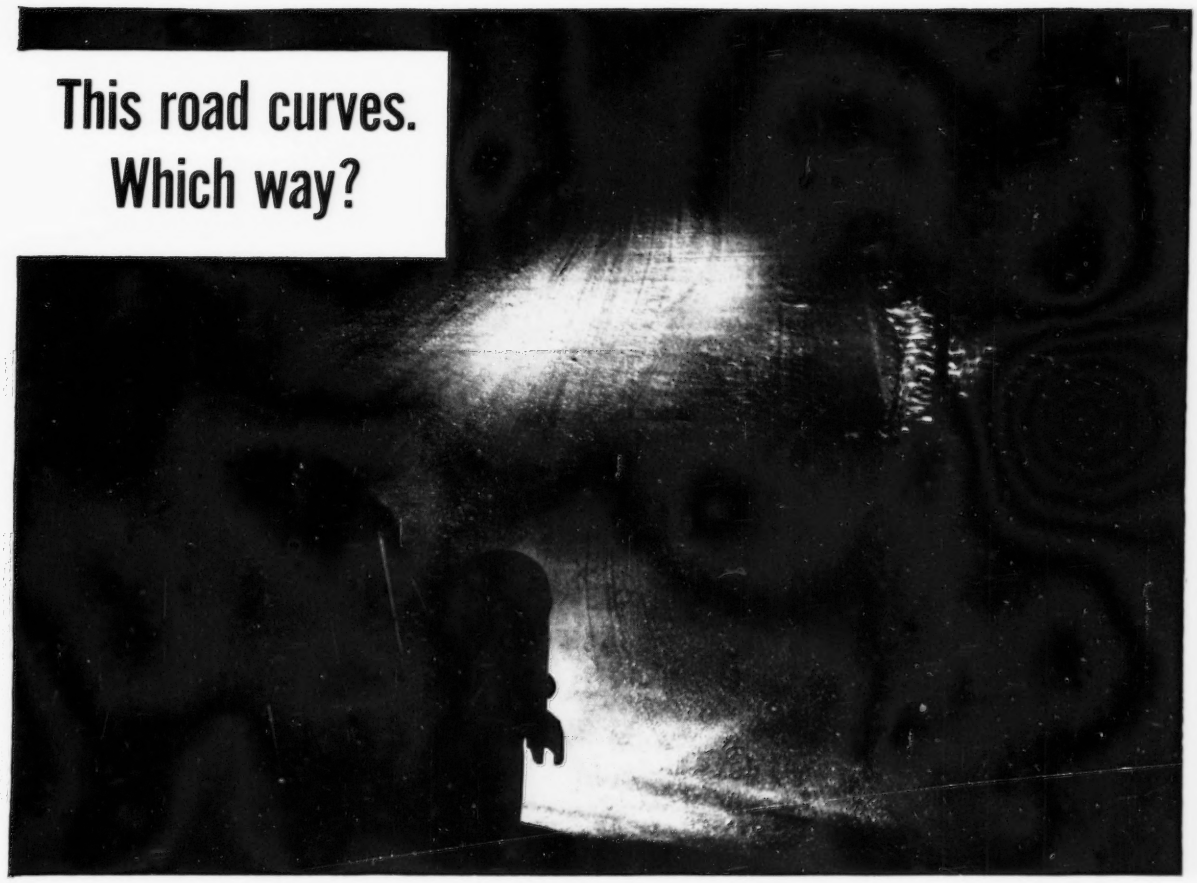

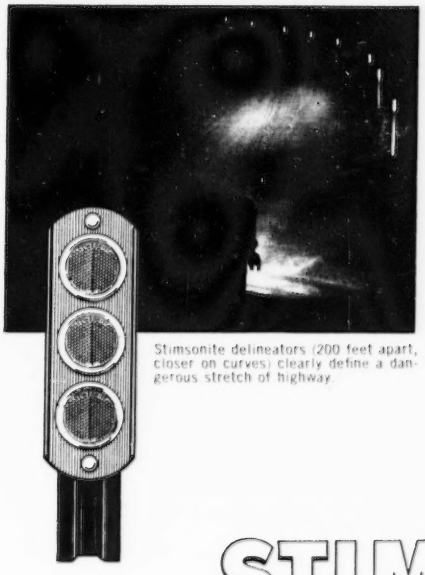

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Traffic Engineering

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VOLUME 24 MAY, 1954 NUMBER 8

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COVER: Photograph of one of the nine toll barriers across the 168-mile Garden State Parkway in New Jersey. There will be seven other ramp toll stations. Traffic prognostication anticipates 52,833,000 vehicles for 1955, including 30,583,000 toll-paying rides, providing revenues of $12,003,000.

PURPOSE: Traffic Engineering is that phase of engineering which deals with the planning and geometric design of streets, highways, and abutting lands, and with traffic operation thereon, as their use is related to the safe, convenient, and economic transportation of persons and goods.

Published Monthly by the

Institute of Traffic Engineers

PUBLICATION office:
Interstate Printing Corp.
400 Watchung Avenue
Plainfield, New Jersey

EDITORIAL AND ADVERTISING offices:
Stratheona Hall
New Haven 11, Connecticut

Entered as second-class matter November 7, 1941, at the Post Office at Plainfield, New Jersey, under Act of March 3, 1879. ¶Single copies 40 cents, subscription price $3.50 per year in the United States; $4.75 per year to foreign countries. Other publications of the **Institute of Traffic Engineers** include Annual Proceedings, Traffic Engineering Handbook and Technical Bulletins.

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Frankly Speaking

"ARTERIES" IS A GOOD NAME for the principal routes of travel. The man who first gave them that name had a true notion of the anatomy of the modern community and of the circulatory function of highway traffic. It might be well if we went a step further and called the lesser roads and streets "small arteries" and "capillaries."

It may help the traffic engineer to remember that he is concerned with an organic circulatory system which has many of the same diseases afflicting the human body. Some of his problems resemble those which frequently baffle the doctor's skill, but in treating them he has certain advantages over the practitioner dealing with living tissues.

Considered as pathological conditions, traffic engineering problems fall into two classes—functional disorders and organic maladies. These affect, respectively, the arterial movement and the arteries themselves.

Traffic flow, no less than the blood stream, may suffer from thrombosis or clot. Left turning vehicles, particularly those of large dimension lodged in the middle of a heavy two-way traffic stream, do not cause sudden death but often paralyze traffic movement. Even traffic control signals badly placed or faultily timed may produce this condition. But, where the physician must depend largely on time and nature to repair the damage done to a human victim, the traffic engineer has remedies at his command to modify or even eliminate most of the conditions producing his type of arterial blocking.

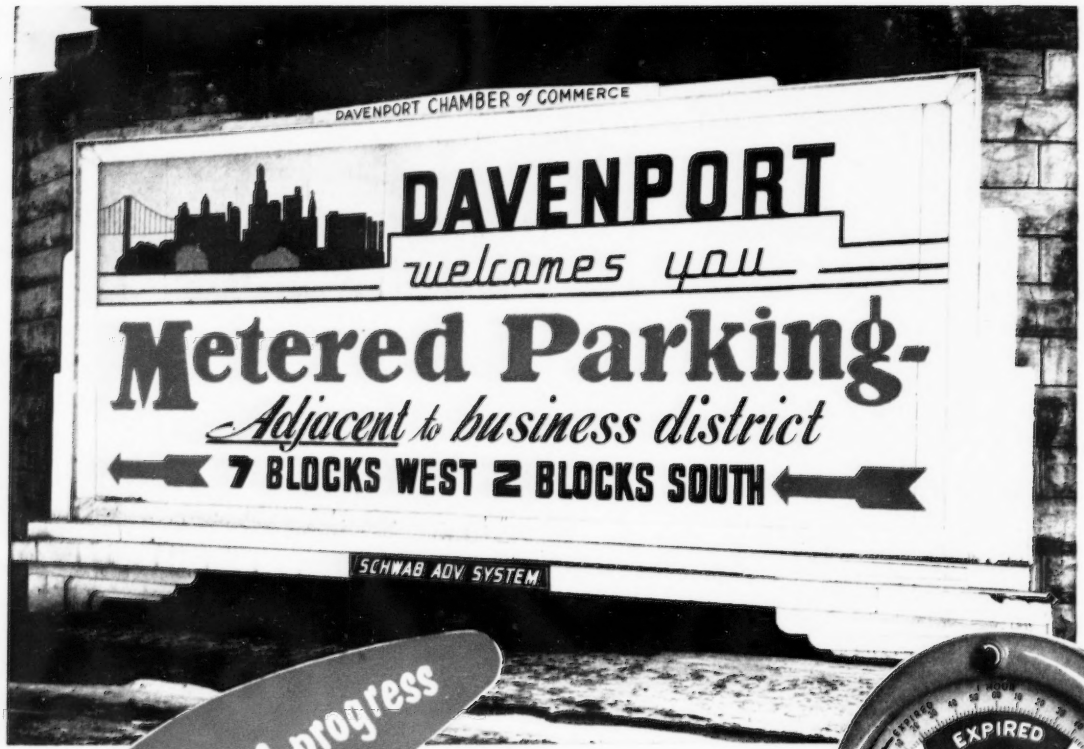
Hypertension is another disease that interferes with arterial circulation. High traffic pressure often bogs down the flow in a traffic artery. Here again the traffic engineer has a marked advantage over the medical doctor. While the latter can only prescribe palliative treatments, the engineer has recourse to a number of well-tested therapies or remedies and can usually reroute some of the traffic around the congested area or establish a pair of one-way streets to carry the traffic. As a last resort he can advise operative procedures much more drastic than any surgeon ever could attempt on the human body.

Surgical treatment of arterio-sclerosis, or hardening of an artery, is not available for humans, but for traffic ills is clearly indicated where a major artery has become so hardened and encrusted by the structures and activities of trade that it no longer can carry its traffic stream. Where this condition is chronic, it can be remedied, at high cost, either by excising the growth on one side of the artery, thus widening the circulatory channel, or by slashing around the affected part and emplanting an alternate expressway artery in the incision.

In suburban areas hardening of a traffic artery is frequently caused by the parasitic growth of mercantile establishments along the roadside. In these cases the engineer can do much to control the effect of the disease and may even be able to seal off sections of the artery from the surrounding growth. However, since the discovery of the prophylactic action of limited access treatment, there is little excuse for such conditions developing on a new artery.

But enough of analogous comparisons. What I want to say is that the traffic engineer deals with highly complex problems affecting an essential circulatory function. He should analyze each one as carefully as the best doctors diagnose their patients' symptoms. The traffic engineer has his own kit of devices, instruments, standard remedies, and even a few wonder drugs—he has good medicine and should prescribe it only on the basis of a thorough knowledge of each case.

Director
District Number Three



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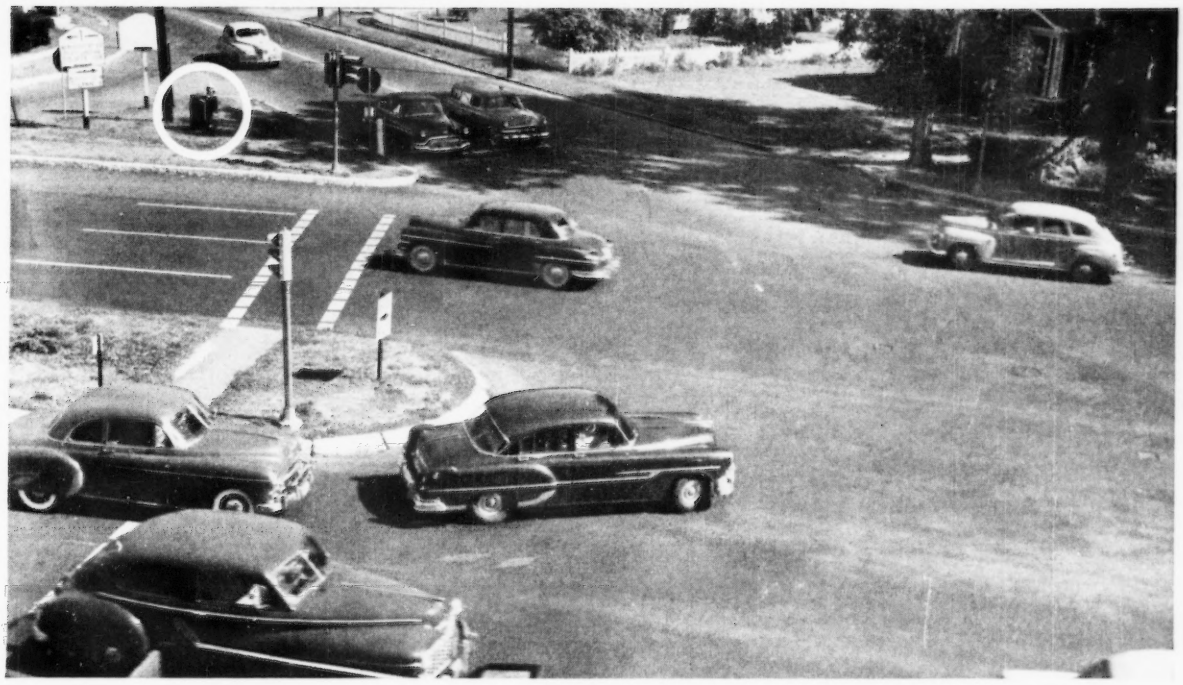

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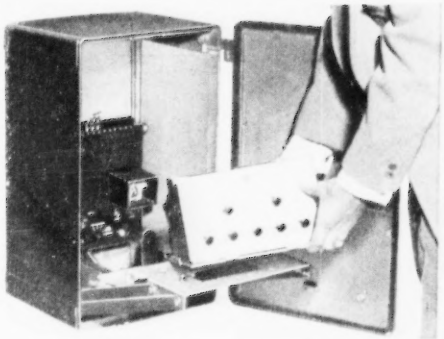

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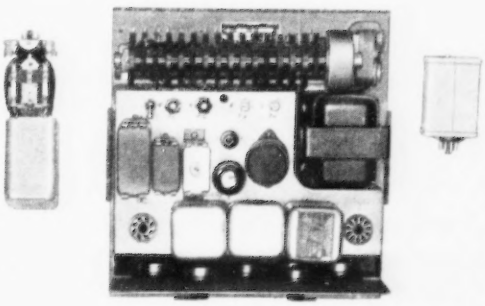

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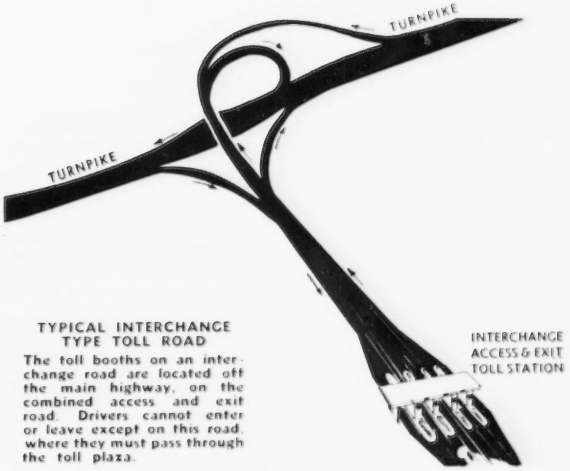
Barrier System Toll Roads - Their Merits

New Jersey's Garden State Parkway Offers a Different Approach to Highway Problems —and Presages Possible Changes in Traffic Planning

By Samuel G. Nowell, Jr.
Business Manager, Traffic Engineering Magazine

TYPICAL BARRIER TYPE TOLL ROAD

The toll booths on a barrier road are situated across the main highway. Drivers may enter or leave via free access or exit roads located at various points along the highway.



TYPICAL INTERCHANGE TYPE TOLL ROAD

The toll booths on an interchange road are located off the main highway, on the combined access and exit road. Drivers cannot enter or leave except on this road, where they must pass through the toll plaza.

THE UNITED STATES is experiencing one of the most feverish transportation booms since the canal building rush of the last century. Now it is not canals. It is toll roads. Almost everyone sees them as a big part of the answer to the nation's pressing highway problems.

Over 1200 miles of these pay-as-you-ride turnpikes are now being built, more than doubling the present toll road mileage. Highway engineers are carefully watching these new roads, anxious to see how financially successful they will be. But almost everyone now admits that wisely planned and operated toll roads are completely feasible.

The big question in the mind of the experts has to do with something else. There has arisen a basic and very important disagreement over which of two types of toll roads is best. It is realized that the opinions and reasons both for and against each system have many important features.

One type is exemplified by the New Jersey Turnpike, whose phenomenal "overnight" success has spurred the construction of most of the newer toll roads. Motorists enter and leave the road only at certain designated locations, called "interchanges," where toll booths are set up to control traffic. Drivers have to stop once upon entering to receive a trip ticket, and once upon leaving to surrender the ticket and pay their toll. Travel between entry and exit can be non-stop, as there are no traffic lights, intersections or toll stations to interrupt the journey.

Tolls on an interchange turnpike are based on distance travelled, with different types of vehicles being charged different rates per mile. The fare is computed from the trip ticket when the vehicle leaves the turnpike.

The other kind of toll road operates on an entirely different principle. The driver receives no trip ticket, and may enter or leave the road at any number of unregulated spots. He may travel a good distance on the road and then leave without paying any toll at all. But chances are, if he drives more than a few miles, that he will meet a line of toll booths stretched across the highway. This is known as a barrier toll station. Here he has to pay a certain fixed toll for his type of vehicle, regardless of how far he has travelled on the road before reaching the barrier.

If he travels the whole length of the highway he will come across several barrier stations, and must stop and pay a toll at each one.

The Merritt Parkway in Connecticut and the Westchester County Parkway System in New York are barrier roads. Both have been operating very profitably for a number of years, and their continuing success has won many adherents for the barrier toll system.

A third major toll highway will soon join their ranks. The 168 mile Garden State Parkway in New Jersey will become the longest and most modern barrier toll road in the country. Part of it is already open to traffic. All of it will be ready before 1955. It stretches from Paramus in Northern New Jersey, down along the coast line, past most of the state's famous sea resorts, to Cape May. More than 30 million vehicles are expected to use it during its first year of operation. This would make it one of the most travelled toll roads in the nation.

FRONTISPIECE

New Jersey's famous Turnpike, showing toll plazas for the Lincoln Tunnel Interchange and north and south bound arteries.

Garden State Parkway

It will give the engineers and toll facility managers the sort of test they have been waiting for. They will be able to compare the records of superhighways of both types, and get some positive answers. The experience of the Merritt and Westchester Parkways indicates that a big change in the country's highway thinking may be in the offing. The shift, it appears, would be from interchange roads to barrier roads, with the Garden State Parkway leading the way.

After the great success of the New Jersey Turnpike, everyone seemed to accept the interchange toll road as the last word in highway development. When other states decided to get on the toll bandwagon, they naturally patterned their toll collection systems after New Jersey's. And in many ways these non-stop turnpikes have been fabulously successful.

But, over the years, a number of shortcomings have appeared. Many experts feel these shortcomings are inherent to toll roads, and see no practical way of eliminating them without scrapping the whole system. On the other hand, the barrier road advocates claim to have overcome the shortcomings of the interchange toll road. With the Garden State Parkway well on its way to completion, the full story should soon be in. Here are some of the contentions the experts expect to see proved:

1. *Barrier roads are safer*—This is one of the strongest arguing points for the barrier system. All over the nation people are appalled at the mounting injury and death rate on highways. It is true that turnpikes have been unjustly maligned in this respect, for their safety record is not the worst in the nation (as many seem to think) but actually the best. Both the accident and death rates on the New Jersey and Pennsylvania Turnpikes are far lower than on the country's other first rate roads.

But everyone agrees there are still too many persons being killed and maimed in accidents. One of the main causes of turnpike accidents is "driver hypnosis," brought about by long unbroken stretches of driving on a road that, by its very beauty and utility, becomes monotonous. The driver either falls asleep at the wheel or becomes so dulled and drowsy that he doesn't have the necessary alertness to control his car. His reaction time has slowed up too much for him to be able to stop or swerve suddenly to avoid a collision.

Highway planners used to like to talk about "driving non-stop from New York to Chicago" along a system of connected toll turnpikes. There was something romantic about the notion, something that caught men's imaginations. And within a few years, with the completion of the Ohio, Indiana, New York, Pennsylvania and New Jersey Turnpikes, it will have come true. But many people are beginning to wonder whether the glamour attached to a non-stop turnpike isn't deceptive and, to a great extent, dangerous and destructive.

The Pennsylvania Turnpike, for instance, in most places has two wide lanes in either direction, plus a comfortable shoulder lane. The western part, however, follows a series of tunnels through the mountains. These tunnels have just a single, extremely narrow lane in each direction, separated only by a line of white paint. They are also quite dark, and seem even darker to a driver entering on a bright day.

When they were opened for traffic everyone concerned held their fingers crossed. They feared an enormously high accident rate, much higher than on the turnpike proper.

But that was not how it worked out. The accident rate in the tunnels was significantly lower than on the open road.

Engineers studied the situation, and came up with some answers. A driver approaching the tunnel would slow down from sixty or seventy miles an hour to thirty-five, rouse himself, shake his head perhaps, sit up and drive cautiously and alertly through the "dangerous" tunnel. Then, out on the "safe" open road, he would sit back again and relax, and perhaps fall asleep at the wheel—something he would never do inside the tunnel.

The big advantage of barrier toll roads in this respect is that the motorist is not allowed to drive for hours on end. He has to stop regularly at the barrier stations. This all but eliminates the danger of driver hypnosis accidents. Even though he may only stop a few seconds, the driver has to brake his car, change his position, get out his money, open his window and tender his toll. Often he will speak to the collector, or just thank him. Even this can be enough to rouse him from a drowsiness that might otherwise be fatal.

New Jersey Turnpike

A second and perhaps more spectacular type of accident on non-stop toll highways is caused by suddenly changing weather conditions. Often a heavy fog will come up unexpectedly over a part of the highway, or the road will become wet or icy. Motorists driving along at high speeds may not know this until it is too late, since it is difficult to warn drivers of changes that have occurred since they entered the road. This has caused many traffic "pile-ups" on existing turnpikes.

The barrier turnpike offers an easy solution to this problem. If weather conditions along a given section take a turn for the worse, the highway police notify the barrier

stations by radio or phone. The toll collectors can then start warning all motorists a scant few minutes later, long before the police would be able to change speed limit signs or post warnings.

It is also a simple matter on a barrier road to close off single sections of the highway when weather conditions warrant, while at the same time keeping other sections of the road open. This is much more difficult to do on an interchange road.

2. *Barrier toll roads discourage fraud*—The existence of fraud among toll collectors has always been a problem. Hundreds of men work under little supervision at scores of out of the way locations. Each handles thousands of dollars a day—in cash. The temptation to steal and cheat is great, for the situation encourages dishonesty.

Many devices and procedures have been developed to combat turnpike fraud, but it still remains a problem, and a very costly one. With so much money changing hands, there will always be dishonest men trying to get a share of it for themselves.

Because of its simpler and less cumbersome collection system, the barrier road is far better equipped to cope with such fraud.

For one thing, the fare collected at barrier stations—based only on type of vehicle regardless of distance travelling—eliminates a great deal of complicated bookkeeping and auditing work. This single fare for each type of vehicle makes possible a much closer and more reliable check on collector operations. There are no trip tickets to keep track of, no expensive office equipment and time consuming procedures needed. And it is the existence of trip tickets that opens the door to so many forms of fraud on interchange turnpikes. The dishonest uses to which they can be put are many, most of them too complicated to explain in a few words.

However, it must be understood that these trip tickets represent fares collected, and they may be destroyed, sold or traded at a profit for the dishonest collector and a loss for the turnpike authority and the public. By eliminating these tickets and simplifying the whole collection and auditing procedure, the barrier toll road assures itself of the best available protection against fraud.

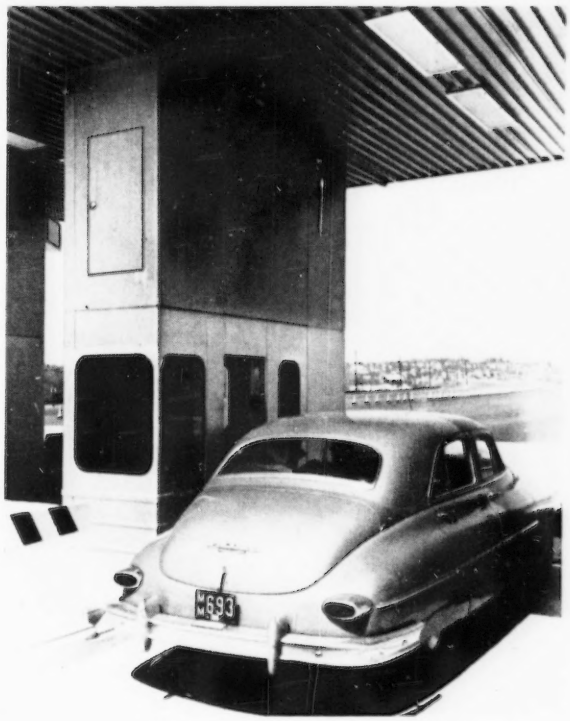
3. *Barrier roads cost less to build*—As with everything else, the cost of roads has skyrocketed. The original section of the Pennsylvania Turnpike was built in 1939 at a cost of less than .5 million dollars a mile. The New Jersey Turnpike cost about 2.2 million dollars a mile in 1952.

One of the biggest expenses is the purchase of right of way. That is part of the reason for the high price tag on the New Jersey Turnpike, which runs through densely populated sections with high land values.

Toll interchanges on non-stop turnpikes require large and complicated cloverleafs, which are expensive to build and need considerable land area. In addition, many bridges and underpasses must be constructed to maintain limited access to the road.

The New York State Thruway, which is now being built, offers interesting proof of the greater expense of interchange roads. For every mile of centerline Thruway being built between New York City and Buffalo (427 miles), there has to be built nearly one mile of interchange access roads, approaches or relocations of existing roads. In addition, there is the fantastic total of 522 bridges needed along the Thruway route to cross waterways and intersecting roads.

4. *Barrier roads are more acceptable to local and in-state residents*—This is an extremely important point. One of the biggest headaches for toll road commissions is the widespread and often violent opposition of local residents. Citizens of towns along the right of way usually resent the turnpike. They fear loss of trade since drivers on high speed, non-stop roads will not leave them to patronize the town's shops and restaurants. They also dislike having to pay a toll on the turnpike, especially if they will use it regularly for local or commuting travel.



Toll Booth, Garden State Parkway

These two damaging criticisms are aimed specifically at the interchange road. The New York Thruway sells cut-rate yearly permits to in-state residents to placate them on the second point, but this is only a partial answer. The barrier road is designed to answer effectively both criticisms.

A great deal of study, for instance, went into selecting the locations of the barrier stations along the Garden State Parkway. They were carefully positioned to provide maximum travel by local traffic without tolls. Thus residents who commute between nearby towns may in most cases take advantage of the Parkway's facilities without charge.

Local fears about loss of business are also largely quieted by the barrier road, since drivers are allowed to enter and leave the road freely and will be much more likely to pull off the highway and patronize towns along the way.

All these factors—safety, fraud prevention, economy, greater local approval—support those engineers and public officials who see the barrier toll road as the highway of the future. These are the people who are waiting confidently for the Garden State Parkway to give the final stamp of proof to their already well documented ideas. With the first section already operating and most of the other sections scheduled to open within a couple of months, it won't be long before the country may have an answer as to which kind of toll road will best serve its future highway needs.

Attendant-Parking vs. Self-Parking

This paper is the Third of three Spot Studies in Parking Research which were presented to the Parking Project Committee at last year's Annual Meeting of the Highway Research Board.—EDITOR.

THE WURZBURG GARAGE is a conventional ramp-type garage with a maximum capacity of 425 cars with clear aisles, with reservoir space for 24 cars. It operates normally only from 8 a.m.-5:30 p.m. and all cars are parked by attendants, the usual force being a manager, cashier, doorman, and 12 attendants. It is owned by the Wurzburg Department Store, was built in 1951, and is operated (for the Wurzburg Co.) by National Garages, Inc. Its location is one-half block from the main business street of the city and is directly across a narrow side street from the Wurzburg store. It does not offer monthly rates.

The Municipal Garage, also built in 1951, is the continuous ramp type, its rectangular spiral ramp giving the equivalent of four floors plus a roof, with a capacity of 320 cars plus a small reservoir space for about six cars. The ramp (except at the front and rear of the building) is 61 feet wide, providing a 24-foot aisle with 90 degree parking on each side (on one side only at the front and back). The aisle has two-way travel and has a gradient of only four per cent. All parking is by the car driver, and all floors are serviced by a push-button elevator. The garage is open 24 hours a day, and during the daylight hours, uses only a supervisor-cashier and two attendants, whose duty is primarily to issue and collect tags, with only occasional assistance to timid drivers. The facility was built by the Grand Rapids Automobile Parking Authority, and is operated under the supervision of the Traffic Engineering Division of the city. Its location is three blocks or about 850 feet from the main business street (Monroe Avenue). It offers special monthly rates to regular users.

The study was brought about by the opportunity for a comparison between the operating characteristics of an attendant-parking facility and one having self-service, because of the apparent indication that the Wurzburg Garage (attendant-parking) was much more favored by women drivers, and from the fact that because of the dissimilar locations there was interest in the area served by each facility and the usage given each by shoppers and by others.

A brief study was made on June 12, 1952, at the Wurzburg Garage from 10 a.m.-4:30 p.m. and at the Municipal Garage from 10 a.m.-8:30 p.m. Observers were provided by National Garages, Inc., Ramp Buildings Corporation and the City Traffic Engineer. During the study period as many as possible of the parkers were observed and interviewed, the interviews being made when drivers returned for their cars. Both garages made available their ticket stubs for the 24-hour day including the study period, permitting some comparison of the sample with the total load.

Studies at Wurzburg and Municipal Garages
Grand Rapids, Michigan, June 1952

Garage usage	Wurzburg Number	Wurzburg Per Cent	Municipal Number	Municipal Per Cent
Total parking In, 24 hours	757			
Total parking Out, 10 a.m.-4:30 p.m.	612			
Total Interviewed 10 a.m.-4:30 p.m.	218	37.3		
Total parking In, 24 hours (transients)			446	
Total parking In, 24 hour (monthly rates)			100	
Total parking In, 24 hours (total)			546	
Total parking Out 10 a.m.-8:30 p.m. (Transients)			405	
Total Interviewed 10 a.m.-8:30 p.m.			311	76.8
Peak occupancy	269	63.3	278	87

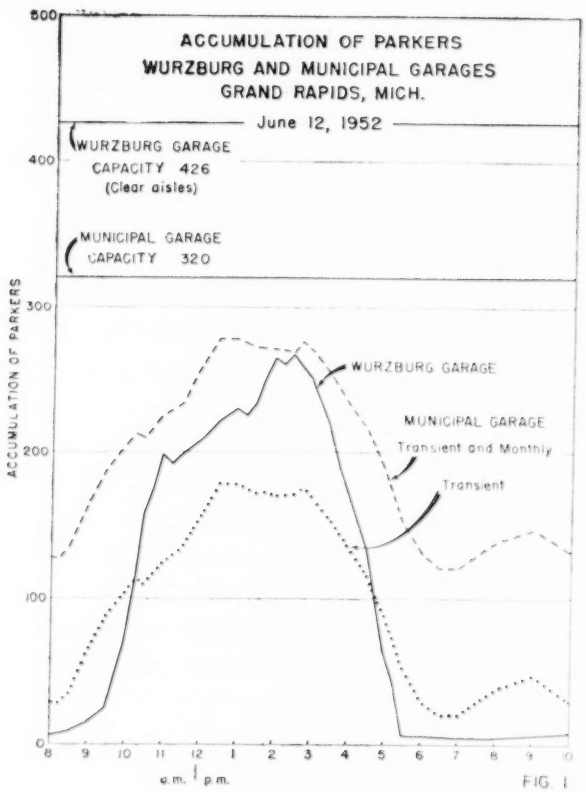


FIG. 1

Figure 1 shows the accumulation of parkers at each garage. At the Municipal Garage no observations were made of the monthly rate parkers, and the accumulation curve for all parkers has, therefore been set at a fixed distance above the curve for transients, to represent the 100 spaces used by these regular patrons.

The accumulation at the Municipal Garage is at all times higher than at the Wurzburg Garage, but this of course does

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not indicate that it has more users. On this day the Wurzburg Garage handled 757 parkers as against 546 at the Municipal Garage. The turnover at the Municipal Garage was 546/320 or 1.71, while at the Wurzburg Garage it was 757/426 or 1.78 (clear-aisle capacity).

It should be noted that the Municipal Garage reached 87 per cent occupancy at the peak, while the Murzburg Garage reached only 63 per cent of its clear-aisle capacity. It should also be noted, considering the normal business hours of 8 a.m. - 5 p.m., that in each case a very large proportion of the space-hours available were not used, even though both garages are "doing a good business." This is of course due to the fact that the demand for space is not uniform throughout even these hours. And, since it probably never will be, it is evident that the "theoretical" capacity of such facilities (in space-hours) must be heavily discounted for planning purposes. Figure 2, showing the arrival of parkers by one-hour periods, gives a much clearer picture of the relative use of the two garages.

Based upon the parkers interviewed, the durations of parking were as follows:

Duration of parking	Wurzburg Number	Wurzburg Per Cent	Municipal Number	Municipal Per Cent
Less than 1 hour	57	26.2	52	18.9
1 - 2 hours	102	46.7	87	31.6
2 - 3 hours	40	18.4	59	21.5
3 - 4 hours	11	5.1	29	10.6
4 - 5 hours	5	2.3	16	5.8
5 - 6 hours	2	0.9	8	2.9
6 - 7 hours	1	0.4	4	1.5
7 - 8 hours			7	2.5
8 - 9 hours			8	2.9
9 hours and over			5	1.8
	218	100.0	275	100.0
Unknown			36	
			311	
Average time parked	1 hr. and 38 min.		2 hrs. and 40 min.	

The longer average time used at the Municipal Garage is presumably due to the fact that it serves a much smaller proportion of shoppers and a much larger proportion of workers, to some extent to its somewhat more remote location from desired destinations, and to its lower rates for longer periods.

Sex of drivers	Wurzburg Number	Wurzburg Per Cent	Municipal Number	Municipal Per Cent
Male	64	29.3	243	78.0
Female	154	70.7	68	22.0
	218	100.0	311	100.0

Evidently the preponderant use of the Wurzburg Garage is by women, with an equally preponderant use of the Municipal Garage by men. This is not necessarily an indication of a preference.

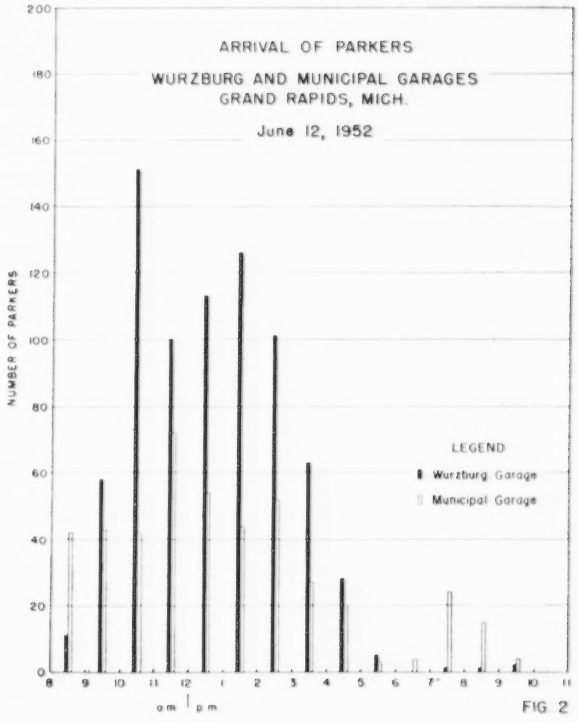


FIG 2

Make of car: (all drivers)		Wurzburg Number	Wurzburg Per Cent	Municipal Number	Municipal Per Cent
	Light	96	44.0	131	32.2
	Medium	82	37.6	108	34.7
	Heavy	40	18.4	72	23.1
		218	100.0	311	100.0

Make of car: (women drivers)	Wurzburg Number	Wurzburg Per Cent	Municipal Number	Municipal Per Cent
Light	67	67/96 — 70%	30	30/131 — 23%
Medium	59	59/82 — 72%	23	23/108 — 21%
Heavy	28	23/40 — 70%	15	15/72 — 21%
	154		68	

If garage or ramp design were critical factors in influencing the choice of a garage, the proportion of women drivers with heavy cars would be smaller at a self-parking garage. Analysis showed that this was not a factor.

Trip purpose:	Wurzburg Number	Wurzburg Per Cent	Municipal Number	Municipal Per Cent
Shopping	172	78.8	51	16.4
Business	42	19.3	171	55.0
Dr., Dentist	3	1.4	8	2.6
Soc., Rec., Eat	1	0.5	48	15.4
Work			33	10.6
	218	100.0	311	100.0

There are sharp differences in the purposes of the users of the two facilities, probably due more to their respective location than to any other factor. It should not be concluded,

for example, that Wurzburg's draws shoppers because shoppers are largely female and females prefer attendant service.

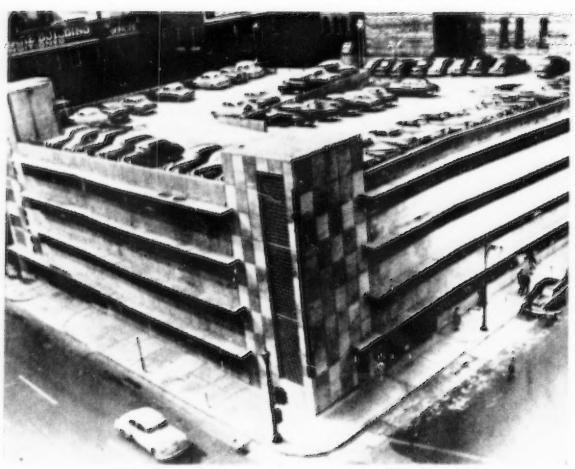
Frequency of trip:	Wurzburg Number	Wurzburg Per Cent	Municipal Number	Municipal Per Cent
Once per week	103	47.2	62	19.9
More	69	31.6	158	50.8
Less	46	21.2	91	29.3
	218	100.0	311	100.0

The figures above are only for those parkers interviewed at each garage, and no interviews were made with the monthly rate parkers at the Municipal Garage. It may be assumed that this group used the facility more than once a week. If they were included in the figures, it would show that in each garage the same proportion (78 per cent) use the facility once a week or more.

Use of other garage:	Wurzburg users Number	Wurzburg users Per Cent	Municipal users Number	Municipal users Per Cent
Has used other garage	70	32.1	116	37.3
Has not used other garage	148	67.9	195	62.7
	218	100.00	311	100.0

Preference of *all* drivers who have used both garages:

	Wurzburg users Number	Wurzburg users Per Cent	Municipal users Number	Municipal users Per Cent	All parkers Number	All parkers Per Cent
For the Wurzburg Garage:						
Because of location	17		11			
Won't park selves	14		3			
Like attendant parking	11		6			
	42	60.0	20	17.2	62	33.3
For the Municipal Garage:						
Because of location	1		20			
Like to park selves	14		37			
Faster	2		9			
More security	1		6			
Cheaper			3			
	18	25.7	75	64.7	93	50.0
No choice	10	14.3	21	18.1	31	16.7
	70	100.0	116	100.0	186	100.0



Municipal Garage, Grand Rapids, Michigan

Wurzburg Garage, Grand Rapids, Michigan

Preference of women drivers who have used both garages:

	Wurzburg users Number	Wurzburg users Per Cent	Municipal users Number	Municipal users Per Cent	All women Number	All women Per Cent
For the Wurzburg garage:						
Because of location	13		1			
Won't park selves	9					
Like attendant parking	10		2			
	32	72.8	3	8.8	35	44.8
For the Municipal garage:						
Because of location			4			
Like to park selves	6		9			
Faster			6			
More security			1			
Cheaper			2			
	6	13.6	22	64.7	28	35.9
No choice	6	13.6	9	26.5	15	19.3
	50	100.0	34	100.0	78	100.0

For all drivers (of both sexes) who had used both garages the preference for the Municipal Garage was 1.5 to 1. This preference was expressed in response to the question "Which service do you prefer (self-parking or attendant-parking)—and why?" Service is, of course, not necessarily the governing factor in selection of a facility, since the location is always important. It is of interest that a number of drivers gave "security" as their reason for preferring the Municipal Garage, having reference to the fact that their cars are not handled by others and also that cars may be locked.

The women drivers who had used both garages appear to prefer the Wurzburg Garage 1.25 to 1. However, it should be noted that many of the answers were not directly responsive to the question about self versus attendant parking. If the preferences based on location and price are eliminated, then for women drivers the preferences were

	Number	Per Cent
For the Wurzburg Garage:		
Won't park selves	9	
Like attendant parking	12	
	21	49
For the Municipal Garage:		
Like to park selves	15	
Faster[1]	6	
More security[1]	1	
	22	51

[1]These factors included because they are ascribed to the self-parking feature of the Municipal Garage.

Areas Served by the Garages

The map of Destinations of Parkers (Figure 3) shows clearly the areas served by the two facilities, Wurzburg's patrons being largely destined for Monroe Avenue and points south of it, with the Municipal Garage patrons largely north of Monroe Avenue.

Distance walked, feet	Wurzburg Number	Wurzburg Per Cent	Municipal Number	Municipal Per Cent
0-100	155	71.0	37	11.9
100-200	3	1.4		
200-300			26	8.4
300-400	10	4.6	22	7.1
400-500	4	1.8	37	11.9
500-600	3	1.4	37	11.9
600-700	23	10.6	6	1.9
700-800	4	1.8	21	6.8
800-900	9	4.1	6	1.9
900-1000	1	0.5	66	21.2
1000-1100	2		11	
1100-1200			21	
1200-1300			11	
1300-1400				
1400-1500		2.8	4	17.0
1500-1600			3	
1600-1700	2			
1700-1800	1		1	
1800-1900			2	
1900-2000	1			
	218	100.0	311	100.0
Average	233 feet		611 feet	

The very great difference between the average walking distances is perhaps largely due to the fact that the principal parking generator, Wurzburg's Department Store, is practically adjacent to the Wurzburg garage. It might be thought that the sex of driver would be an influence, but a study of the women parkers at the Municipal garage shows their average walking distance to be 659 feet, almost identical with that of the men. The slightly lower fee schedule at the Municipal garage undoubtedly has some influence in attracting longer time parkers, who usually are willing to walk longer distances. At the Municipal garage 50 per cent of the users parked over two hours, as compared with 27 per cent at the Wurzburg garage, and the respective average durations were 2 hours and 40 minutes, and 1 hour and 38 minutes.

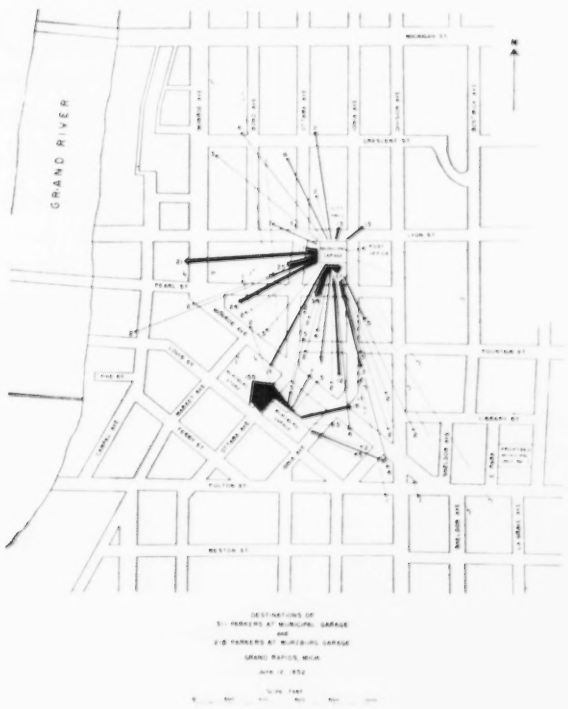


Fig. 3

Fee schedule	Wurzburg	Municipal
1 hour	$ .20	$ .25
2 hours	.35	.35
3 hours	.50	.45
4 hours	.65	.50
5 hours	.80	.60
6 hours	.95	.70
7 hours	1.10	.80
8 hours	1.25	.90
Evening	.40	.40

			No. users
Monthly rates	3:30 p.m.-10:00 a.m.	$8.00/month	4
	5:30 a.m.- 7:00 p.m.	$14.00/month	92
	24 hours per day	$17.00/month	6

Operating Cost Data are not available. The Wurzburg garage, when handling about 7009 cars per day, uses a manager, a cashier, a doorman, and 12 attendants. The Municipal Garage (handling a smaller number but open practically all the time) is using a supervisor, two men on the 8:00-4:00 shift, two on the 4:00-12:00 shift and one on the 12:00-8:00 shift. Since one facility is owned and operated privately and the other municipally, it would be difficult to

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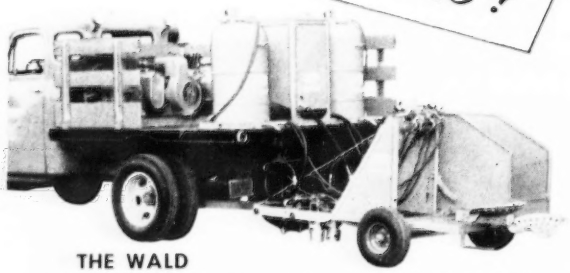

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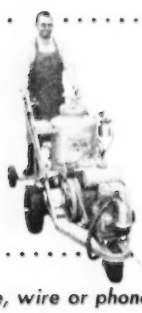

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compare the total expense, but it is obvious that a self service garage can be operated at a lower cost per car handled than one which is attendant operated.

Conclusions

It is clear that the Wurzburg Garage is used preponderantly by shoppers and hence by women; that perhaps because of its fee schedule it does not attract long-time parkers; and that, largely because of its location and perhaps because of its name association with the Wurzburg store, it serves only a limited area.

The Municipal Garage, on the other hand, is used largely by men and other-than-shoppers, and has more long-time parkers; its parkers (perhaps because of lower fees) walk considerably longer distances and it hence serves a larger area.

It is evident that some women "won't park" themselves and that (at present at least) some others "prefer attendant parking." But a slight majority of the women who have used both types prefer the self-parking. Although it is not a feature brought out by the study data, it is very probable that the attendant parking would have some extra appeal for women shoppers carrying bundles or accompanied by children. In that connection, the Wurzburg Garage maintains a fleet of strollers available at no charge and getting wide usage.

The two garages, because of their purposes, have perhaps somewhat different policies which have a bearing on their operating costs. The Wurzburg Garage, although professionally operated, is owned by a department store, and has the objective of attracting as many potential store customers as possible, with the cost not a controlling item. By using attendants, less space per car is required, but the use of attendants requires a much larger reservoir space (24 spaces or more) than would be needed with self-parking. The Municipal Garage, as a public operation or facility, is kept open at all hours and on many holidays, when commercial facilities are closed. But, other things being equal, it would appear that unless or until a garage approaches capacity usage, self-parking should be able to handle just as many parkers as attendant parking and perhaps handle them more rapidly—and usually at a lower cost.

In the consideration of attendant versus self-parking for any proposed facility, it must be understood that the physical design is of the utmost importance. The Municipal Garage in Grand Rapids was designed for self-parking, and the area available was in dimensions ideally suited for that purpose, (a condition which may not often happen) permitting wide aisles with 90 degree parking and very gentle grades. It is obvious that with self-parking there is need for only a very small reservoir area, perhaps for four cars. The attached photographs demonstrate the absence of columns and the good visibility, strongly contrasting with the tight and steep ramps and dark caverns of many older garages. Because of the obvious advantages of self-parking, it is important to make the design one which will eliminate the physical and psychological hazards which have been a handicap in the past, and capitalize on time-saving, security and lower fees.

Proposed Revisions of the Uniform Manual

By Wilbur S. Smith (Member, ITE)

Associate Director, Yale Bureau of Highway Traffic, New Haven, Connecticut

DURING THE PAST YEAR many rumors and much misunderstanding concerning the work of the Joint Committee on Uniform Traffic Control Devices have been rampant. At the meeting of the Institute of Traffic Engineers in Buffalo, N. Y., last September the matter was a subject of discussion at all of the Technical Council and Board meetings, as well as at the general Business Meeting. It has become evident that all members are not familiar with the Joint Committee, its organization, authority, and operational procedure. It is the purpose of this statement to explain and clarify the picture and manifold confusion which has developed.

The Joint Committee is the child of three national organizations dedicated to the promotion of efficiency and safety in the use of the nation's highways and streets. The parent bodies are the Institute of Traffic Engineers, the American Association of State Highway Officials (AASHO), comprised of the officials of the 48 states, District of Columbia, and U. S. Bureau of Public Roads; the National Committee on Uniform Traffic Laws and Ordinances (NCUTLO), which is made up of representatives of all governmental levels and of a large number of national associations concerned with the financing, regulation, use and safety of the public highways (the NCUTLO took over the seat formerly held by the old National Conference on Street and Highway Safety, organized by Herbert Hoover in 1924 and disbanded in 1947). Each of the parent bodies appoints seven representatives to constitute the Joint Committee. Present Committee membership is as follows:

For AASHO:	J. Carl McMonagle (Chairman of group)
	F. B. Crandall
	J. E. P. Darrell
	E. H. Holmes
	C. R. Waters
	I. L. Thomas, Jr.
	One vacancy
For NCUTLO:	D. Grant Mickle (Chairman of group)
	David M. Baldwin
	Donald S. Berry
	J. W. Johnson
	Burton W. Marsh
	J. K. Murphy
	Charles W. Stark
For ITE:	Wilbur S. Smith (Chairman of group)
	D. Jackson Faustman
	Ross C. Harger
	Howard F. Ilgner
	Eugene Maier
	Leslie J. Sorenson
	T. T. Wiley

The Committee has operated without funds. Except for the assistance rendered by the U. S. Bureau of Public Roads, the work has been dependent upon the efforts contributed by the individual members, by the organization they represent, and by other interested groups. The Committee has never been able to undertake directly the basic research so sorely needed to improve the Manual. Instead, it has always had to depend upon the assistance and efforts of practicing engineers, governmental agencies, manufacturers, universities, and individuals who are interested in control devices and their applications. This might be changed in the future, if funds can be procured to employ a full-time staff.

Since the Committee has no funds, its work is greatly aided by the U. S. Bureau of Public Roads, which not only furnishes a repository for the Committee's records, and assists in its publications, but in addition, provides a Secretary and staff assistance. Mr. William G. Eliot, 3d, who has long served as Secretary, continues in that capacity.

Until his sudden passing last August Mr. H. E. Hilts, Deputy Commissioner, U. S. Bureau of Public Roads, served as Chairman of the Joint Committee. Mr. E. H. Holmes, appointed by AASHO last October, was elected Chairman when the Committee met in January.

Since the turn of the year, Committee activity has been accelerated. Chairman Holmes appointed a Subcommittee on Organization, and this group is now engaged in preparation of formal articles of organization and procedure. It is searching many questions, including the need for staff and working funds. More frequent meetings of the Committee are planned. More effort will be made to ascertain the wishes and needs of the principal groups concerned with traffic control devices, including cooperation with the manufacturers (already conferences have been held with the Industry Committee on Traffic Control Devices of the American Road Builders' Association). It now appears that every effort will be exerted by the Committee to keep abreast of developments and new applications of traffic control devices.

The Joint Committee can only *recommend* revision of the official Manual, for approval by the three constituent organizations. It cannot of its own volition make any of its recommendations official policy. It is not generally understood that each action of the Committee is subject to review and approval by each of the parent bodies. Thus, in effect each of the parent bodies has had the "power of veto." In actual practice, the NCUTLO authorizes its representatives on the Committee to give final approval to changes voted. Changes are referred to the AASHO for approval by its Executive Committee. The officers and Board of Directors of the Institute review all recommendations and approve, or disapprove them.

The Committee at a meeting last June adopted recommendations for a considerable number of proposed Manual revisions—perhaps the most controversial being the "Red Stop Sign."* The red stop sign was not the only thing considered at the three-day meeting, the Committee received reports from its standing sub-committee and from several special sub-committees. A proposed United Nations Protocol on a uniform system of Road Signs and Signals was considered and approved in principle only. In all, about 75 specific items were received and discussed. These included the Yield Right of Way Signs, oversized signs, school crossing protections, the four-way stop, signal warrants, illumination, protective treatments for traffic islands, no-passing zones and pedestrian signals, to mention a few only. Many suggested changes were rejected; in a few instances, it was only the clarification of meaning that was necessary. Topics considered included erection, application, maintenance, and costs of all types of controls (signs, signals, markings and islands).

These actions of the Committee have not been confirmed by the ITE nor the AASHO, so that the Manual published in August of 1948 is still the OFFICIAL UNIFORM MANUAL. This will remain the case until the Committee's recommendations have been submitted to each of the constituent bodies for appropriate action.

Chairman Holmes and Secretary Eliot have recently completed a compilation of the recommendations. These recommendations have now been forwarded to officers of the member bodies for official approval as amendments to the Manual.

The Institute is proceeding with the matter in accord with the following plan. Conforming with a request of the Technical Council, the membership has been canvassed for suggestions for Manual revisions and improvements. All the comments will be brought to the attention of the Directors, the Council, and the ITE representatives on the Joint Committee. Meanwhile, Executive Secretary Todd has submitted the Joint Committee's proposals to the Technical Council. The Council will consider the proposals in the light of the membership's comments and suggestions, and formulate recommendations for the Board of Direction's guidance in the matter of final Institute approval.

The following is a complete statement of "Proposed Revisions, 1954" which was recently referred to ITE officers and directors for their consideration and approval:

*Action on the red stop sign, as reported in the official minutes of the meeting, were as follows:

"It was unanimously voted that the Stop sign shall have a red background with white letters, that the message must always be reflectorized and that the background may be reflectorized. Other design details will remain unchanged, as set forth in sec. 29 of the Manual, except that center panels will no longer be optional. This action was taken after a full discussion of the merits of the red sign, its availability in competitive materials, and the durability of red pigments. It was suggested that the revised Manual give a clear explanation of why the change has been made."

"It was voted that the Chairman of the Subcommittee on Signs designate a special subcommittee of from 3 to 5 members to take up with the National Bureau of Standards the determination of a suitable red for the Stop sign, and it was suggested that the Bureau of Public Roads prepare color cards for the correct shade."

Manual on Uniform Traffic Control Devices

Proposed Revisions, 1954

At its meeting of June 8-10, 1953, the Joint Committee on Uniform Traffic Control Devices agreed on certain recommendations for revisions of the 1948 edition of the Manual on Uniform Traffic Control Devices. As it will not be possible to issue a revised Manual immediately, and as there has been a pressing demand for definite decisions on the proposed changes in standards, the Joint Committee on January 11 voted to submit the recommended revisions at once to its several constituent organizations,—the American Association of State Highway Officials, the Institute of Traffic Engineers, and the National Committee on Uniform Traffic Laws and Ordinances—for approval. The changes, if approved, can then be published as official amendments to the 1948 Manual, pending the issuance of a new, and further revised, Manual.

The following revisions of the Manual are accordingly proposed for approval. In some instances a draft or redraft of an entire section is submitted, covering the new or revised standard. Lesser revisions are indicated only as changes or addenda. In any case, necessary adjustments in other sections of the Manual will be an editorial matter, to be given proper attention when the entire Manual text is reviewed in preparing the next edition. The changes are here listed in order, according to the numbered Manual sections to which they apply.

1. Section 9 to be revised so as not to discourage the use of oversize signs, making the first paragraph read substantially as follows:

> The sign dimensions in this manual are to be regarded as the minimum standard. Increases above this minimum are permissible and desirable where investigation has shown that a larger sign is needed for adequate emphasis. The size of any sign must depend on the length of its message and the size and spacing of the letters that form the message, when the message is designed for adequate legibility.

2. Section 12 to include an added paragraph recommending against the use of Series A and Series B letters in reflectorized signs, substantially as follows:

> In reflectorized signs, other than street-name and parking signs, the use of the Series A and Series B alphabets should be avoided, due to their limited breadth and stroke width.

(This change apparently calls for redesign of the standard drawings for signs R-17, W-19, W-29, M-4, M-5, M-6, M-15, M-16, M-17, M-18, and M-19, and a number of State names on route markers).

3. Section 16 to be revised to make borders optional rather than mandatory, and to require only that sign corners be rounded, without specifying a definite radius, substantially as follows:

> Section 16.—Sign Borders
>
> With few exceptions, all signs illustrated herein have a narrow border of the same color as the message, just inside the edge. This improves the appearance and, in the case of embossed metal signs, the embossed border adds materially to their rigidity. A suitable border for 24-inch signs is from three-eighths to five-eighths inch in width, set in three-eighths inch from the edge, and for other sign sizes approximately in proportion. *On metal signs, corners, shall be rounded.*

4. Section 17 (fifth paragraph) to be changed to provide for a higher mounting of rural signs, substantially as follows:

> Signs in rural areas should normally be mounted at a height of at least 5 feet above the crown of the pavement to the bottom of the sign. However, where parking is likely to occur, or where other obstructions are present, the height should be at least 7 feet to the bottom of the sign. In business and in residence districts signs should be mounted at least 7 feet high to the bottom of the sign.

Previous editions of this Manual prescribed a lower minimum height for rural signs, but the higher mounting has been found to put the sign above much of the road splash, without a significant loss of nighttime legibility.

(Change of this section will require changes in figures 1 and 2 secs. 31, 33, 39, 41, 42, 43, 44, 49, 50, 53, 54, 58, 86, 98, 99, 103, 114, and 115, and perhaps elsewhere).

5. Section 29 to be revised in its entirety, to read substantially as follows:

> Section 29.—Design of Stop Sign
>
> Owing to the importance of the Stop sign it is given a distinctive shape (octagon) and color (red). The red color is consistent with the accepted use of a red light as a stop signal and of the color red as a special warning of danger.
>
> *The stop sign shall be octagonal in shape, shall have a red background, and shall carry the word STOP in white letters at least one-third the height of the sign.*
>
> It is generally understood that the original decision to standardize on a yellow background for the Stop sign, rather than on the more logical red, was based largely on the unavailability of red pigments that would not fade on exposure. The standard design, therefore, has hitherto called for a yellow background with black letters, though various arrangements of a contrasting horizontal panel have also been used in an effort to improve legibility, especially in connection with reflectorization. California, having solved the problem of durability by resort to porcelain enamel, has used red for many years. The recent achievement of dependable red finishes, available in competitive materials, has made the red sign practical, and the Joint Committee has recognized an apparent trend of opinion among highway departments by accepting the red sign as the sole standard, eliminating the yellow sign and its variants with contrasting panels.
>
> *The minimum size of Stop signs in rural districts shall be 30 inches by 30 inches.* In residence and business districts a minimum size of 24 inches by 24 inches may be used where speeds are low, traffic is light, and mounting space is limited. The 24-inch Stop sign is disproportionately small in relation to its importance, having an actual area less than 85 percent of that of the standard 24-inch warning sign.
>
> *All Stop signs shall be illuminated or reflectorized at least in the lettering.* Illumination may be by floodlight, or by fixed white light in the letters. Reflectorization may be by white or clear reflecting units or reflecting coating in the

letters, with or without a red reflecting coating on the background. In addition to such illumination or reflectorization, a flashing red signal, in operation both by day and by night, may be incorporated in the face of the sign or placed just above it.

Secondary messages, such as STATE HIGHWAY or THROUGH STREET, shall not be used on Stop signs.

(Other sections that will have to be changed to agree with this revision include secs. 8, 15, 27, and perhaps others, together with numerous illustrations).

6. Section 31.1.—A new section to be inserted, following secs. 28-31 covering the Stop sign, to provide for the use of a "Yield Right of Way" sign, substantially as follows:

Section 31.1.—Yield Sign (R-)

Some States and cities have found that at certain intersections where safety and efficiency require the normal right-of-way rule to be modified in favor of one of the highways, but where the standard Stop regulation is unduly restrictive, a YIELD RIGHT OF WAY sign is both effective and convenient. The effect of the sign is similar to that of a Stop sign, but vehicles controlled by it need not come to a full stop except when necessary to avoid interference with other traffic that is given the right-of-way.

The YIELD RIGHT OF WAY sign shall be an equilateral triangle with one point downward, having a yellow background with black lettering. Its sides shall be a minimum of 30 inches in length. It shall be reflectorized or illuminated.

The Yield sign is still to be regarded as experimental in this country, though as a "Priority Road Ahead" sign it has had extensive and apparently successful use in Europe. Until it has proved its acceptability here it should be used cautiously, and only where suitable legislation has been adopted to define its meaning and to authorize its use. It should not be regarded as a substitute for the Stop sign where a Stop sign is warranted.

(The addition of this section will call for changes or additions to secs. 7, 8, 26, 27, 143, and perhaps others).

7. Section 35 to provide that the SPEED ZONE AHEAD sign shall indicate the approximate length of the speed zone, if in excess of three miles. Insert between the first and second paragraphs of this section the following paragraph.

If the speed zone exceeds three miles in length, the sign shall indicate its approximate length.

8. Sections 39 and 40 to be changed substantially as follows:

Section 39.—Do Not Pass Sign (R-11)

The DO NOT PASS sign may be used on two- and three-lane roads at the beginning of a zone through which restricted sight distance makes overtaking and passing hazardous. *It shall have black letters on a white background, and be of a minimum size of 18 inches by 24 inches. It shall be erected at the right-hand side of the roadway, at a height of 5 feet to the bottom of the sign, not less than 6 feet nor more than 10 feet from the edge of the roadway.* Because . . . remainder of section unchanged, except for name of sign).

Section 40.—Pass With Care Sign (R-12)

The PASS WITH CARE sign may be used at the end of a no-passing zone where a Do Not Pass sign has been erected at the beginning. *It shall be of the same size and color, and shall be erected in the same manner as the Do Not Pass sign.*

9. Section 42 to be changed to delete the arrow on the Keep Right sign.

(This will require a change in figure 20)

10. In section 58, a general provision for the advance placement of warning signs in the sections following, and eliminating the need for the separate specifications in these sections. The revised sec. 58 will accordingly read substantially as follows:

Section 58.—Location of Warning Signs

Since warning signs are placed primarily for the protection of the driver who is unacquainted with the road, it is very important that thought and care be given to their location and erection. Although general specifications can be set up as to the distance at which the signs shall be placed in advance of the hazards warned against, there will be many instances where physical conditions will require different distances. Trial runs should be made by day and by night to determine the most effective location and erection characteristics for each installation. In cities, where speeds are relatively low, warning signs should usually be placed nearer to the points of hazard than on rural highways.

In cities, warning signs shall be erected 250 feet in advance of the hazard, and in rural areas 750 feet in advance, subject, however, to adjustment to local conditions. In rural and residence districts where no parking occurs, warning signs shall be erected not less than 6 feet nor more than 10 feet from the edge of the pavement or traveled roadway, with the lowest edge of the sign 5 feet above the crown of the roadway (fig. 1). In any location where they will obstruct sidewalks or pedestrian paths, however, they should be mounted at a height of not less than 7 feet to the bottom of the sign. *In residence and business districts where parking is frequent, they shall be so set that the bottom of the sign is not less than 7 feet above the top of the curb, and the left-hand edge not less than 1 foot back from the outside edge of the curb.*

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Signs indicating conditions that are temporary or intermittent in occurrence, such as road repairs, should be mounted on low portable standards so that they can be set up and removed as required.

Figures 5 and 6 show typical installations of warning signs.

(Change of this section will require omission of distance specifications in secs. 59, 60, 61, 62, 64, 66, 67, 69, 70, 71, 72, 74, 75, 76, 77, 78, 79, 80, 81, 82, 85, 85, 87, 88, and 90)

11. Section 112 to be revised to reduce the lettering on the Cardinal Direction Marker, and to make use of the marker mandatory; the section, in its entirety, to read substantially as follows:

Section 112.—Cardinal Direction Marker

(M-21)

The Cardinal Direction Marker shall be a plate 16½ inches by 8 inches in size, carrying the word EAST, WEST, NORTH, or SOUTH, in black letters on a white background. It shall be mounted directly above a Route Marker (M-1, M-2) or an Oversize Route Marker (M-101, M-102) to indicate the general direction of the route wherever motorists, in transferring from one route to another, might be confused as to the direction in which the intersected route might take them.

12. Section 116 to have an added paragraph substantially as follows:

Where street illumination is inadequate for clear legibility of street name signs, consideration should be given to their reflectorization.

13. Section 126 to be strengthened by making reflectorization of certain pavement markings mandatory; the revised section, in its entirety, to read substantially as follows:

Section 126.—Reflectorization

All rural pavement markings, if having application at night, shall be reflectorized. Reflectorizing is not ordinarily essential on well lighted city streets, but on other streets it is generally desirable for markings that must be visible at night.

14. Section 146 to be unchanged, but the accompanying figure 18 to be modified to eliminate the transverse markings extending to the left of the center line.

With reference to *Traffic Signals*, Part III of the Manual, the Joint Committee recommended specific changes as follows:

15. In sec. 167, to substitute "Steady yellow (alone, preceding red)" for "Yellow (alone, following green)," to substitute "Steady red (alone)" for "Red (alone)," and to substitute "Steady red with green arrow" for "Red with green arrow."

16. In the same section 167, to add a paragraph at the end of the discussion of "Steady red with green arrow," to read:

Where red is displayed with a *vertical* green arrow it is recommended that a sign be used with the message "Move on Arrow," or its equivalent.

(This will require an additional sign in Part I of the Manual)

17. Sec. 173 to be revised, in its first three paragraphs to provide for two signal faces for each intersection approach, in both rural and urban areas, the entire section to read substantially as follows:

Section 173.—Number of Signal Faces

There shall be two or more signal faces visible to traffic on each approach to the intersection.

The advantages of having at least two faces for each approach roadway are believed sufficient to warrant making this a general requirement. Trucks and busses very frequently obscure one-face installations, leaving the drivers of vehicles immediately behind uncertain of the signal indications as they approach. Two properly located faces will, at practically all intersections, provide drivers with a signal indication sufficiently in advance to insure their proper reaction to conditions at the intersection.

The advantage to pedestrians alone justifies the installation of two signal faces at many locations, since it provides indications within reasonable range of the normal line of sight for all persons on foot. If one of the signal faces is to be on the near side, however, a total of three faces will be needed to provide adequate pedestrian indications. Satisfactory enforcement of pedestrian regulations is difficult unless signal faces are clearly visible for all lines of pedestrian movement.

18. Section 175 to have its last paragraph, in its entirety, revised to substitute a time value rather than a visibility distance, to take account of varying speed conditions, substantially as follows:

Where physical conditions prevent a vehicle driver from having a continuous view of at least one signal indication for approximately 10 seconds before reaching the Stop line, an auxiliary signal location shall be used to provide this visibility. If physical conditions make it impossible to provide any location which can be seen for 10 seconds in advance, a caution signal (sec. 278) or a Signals Ahead sign (sec. 70) shall be erected in a suitable position to warn approaching traffic.

19. Section 194 to have its last paragraph, in its entirety, revised to read as follows:

Some authorities feel that a short all-way red indication not to exceed about 3 seconds in duration immediately after the normal yellow clearance interval has merit at some intersections.

20. Section 208, to have the "warrants" in the second paragraph changed as follows:

In urban areas:

1. Total vehicular volume entering the intersection from all approaches must exceed 750 vehicles per hour for each of 8 hours of an average day, and

2. Total vehicular volume entering the intersection from the minor street or streets must exceed 250 vehicles per hour for the same 8 hours.

In rural areas:

1. Total vehicular volume entering the intersection from all approaches must exceed 500 vehicles per hour for each of 8 hours of an average day, and

2. Total vehicular volume entering the intersection from the minor highway or highways must exceed 125 vehicles per hour for the same 8 hours.

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21. Section 209 to be revised, as to "warrants," like sec. 208, also to add to the urban warrants a qualification relating to coordinated traffic flow and to eliminate specific warrants for short-time or part-time signal control. Retaining the present first paragraph, the remainder of the section to read, in its entirety, substantially as follows:

Minimum warrants for interruption of continuous traffic are as follows:

In urban areas:

1. At an intersection on an important street, the vehicle volume along that principal street must exceed 750 vehicles per hour for each of 8 hours of an average day; and

2. The combined vehicle and pedestrian volume from the side street or streets must exceed 75 units per hour for the same 8 hours; and

3. The average vehicle speed must exceed 20 miles per hour on the principal street approaches to the intersection; and

4. The signal installation must not adversely affect coordinated traffic flow.

In rural areas:

1. At an intersection on an important highway, the vehicle volume along that principal highway must exceed 300 vehicles per hour for each of 8 hours of an average day; and

2. The combined vehicle and pedestrian volume from the side highway or highways must exceed 50 units per hour for the same 8 hours; and

3. The average vehicle speed must exceed 35 miles per hour on the principal highway approaches to the intersection.

Under some conditions there is an apparent need for signals during only brief peak periods, as at the entrance to an industrial plant or a stadium. No numerical traffic warrants can be prescribed for such installations, and their justification can be determined only on the basis of engineering experience and study of the locality.

When for a period of two or more consecutive hours the vehicle volume on the principal thoroughfare or the combined vehicle and pedestrian volume from the side street or highway falls below 50 percent of the minimum volume stated above for urban and rural intersections, flashing operation shall be substituted for fixed-time operation for the duration of such periods of reduced volume.

22. Section 210 to have its "warrants" revised in a manner similar to the changes in sec. 208, as follows:

In urban areas:

1. Pedestrian volume crossing the major street must exceed 250 persons per hour for each of 8 hours of an average day; and

2. Vehicular traffic entering from the major street must exceed 600 vehicles per hour for the same 8 hours; and

3. The average vehicle speed must exceed 15 miles per hour on the approaches to the intersection.

In rural areas:

1. Pedestrian volume crossing the major highway must exceed 125 persons per hour for each of 8 hours of an average day; and

2. Vehicular traffic entering from the major highway must exceed 300 vehicles per hour for the same 8 hours; and

3. The average vehicle speed must exceed 50 miles per hour on the approaches to the intersection.

23. In section 212, the minimum property damage in the "warrants" to be increased from $25 to $50.

24. In section 270, last paragraph, the words "or adult crossing guards" to be added in two places, following the words "officer control."

25. In Section 272, the second numbered paragraph 2 to be revised to read:

2. A rectangular box-type signal in which the words WALK and DON'T WALK and WAIT are properly illuminated.

26. Subdivision H of Part III of the Manual, including sections 295 to 311, to be revised in such a manner as to treat train-approach signals and automatic gates together, but with little change in substance except to provide for special signals where a highway adjacent to a railroad intersects a highway crossing the railroad. The entire subdivision H to be revised into nine sections, 295 to 303, inclusive, substantially as follows:

H—RAILROAD-HIGHWAY GRADE CROSSING SIGNALS AND GATES

Section 295.—*Railroad-Highway Grade Crossing Protection*

Signs are inadequate protection at railroad crossings where highway traffic is heavy, train movements are frequent, or visibility is seriously obstructed. At such crossings, there should be installed signals to indicate the approach and passage of trains, or gates which will extend into or across the roadway to prevent vehicles from entering upon the crossing while trains are approaching and occupying the crossing. The following sections deal only with signals and gates of the automatic type.

Section 297.—*Warrants*

Automatic signals or gates of the type described herein shall be installed at railroad-highway grade crossings to warn highway traffic of any approaching train where the volume of traffic of both the railroad and the highway warrants, or where physical obstructions to clear vision exist on highway approaches. These devices shall be used for no other purpose.

Section 298.—*Types of Control*

Flashing light and wigwag signals may be controlled manually, or automatically through track circuits. *The flashing light signals shall operate until the rear of the train reaches or clears the crossing and they shall operate upon the approach of trains from either direction on the tracks for which protection is provided. The control of "No Right Turn"*

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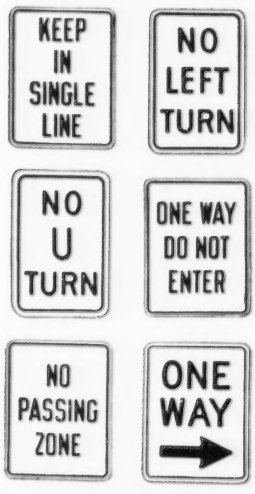

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and "No Left Turn" signals shall be correlated with the grade crossing signal control.

Automatic gates may be controlled manually, or automatically through track circuits. *The gates shall reach the full horizontal position before the arrival of the fastest train operated over the crossing and shall remain down until the rear of the train has cleared the crossing, and they shall operate upon the approach of trains from either direction on the tracks for which protection is provided.*

Section 299.—*Design*

Flashing light signals.—The following provisions relate to the design of flashing light signals.

1. *Signal lights shall be arranged to shine both directions along the highway. They shall be mounted horizontally on 30-inch centers and preferably not less than 7½ feet, nor more than 9½ feet above the surface of the highway.*
2. *Electric light units shall be in accordance with Association of American Railroads Signal Section Specifications 190 or 232. Roundels and outer lenses shall be a minimum of 8⅝ inches in diameter and shall be in accordance with Signal Section Specification 69 of the Association of American Railroads.*
3. *The Railroad Crossbuck sign (Section 89) and the signal shall be mounted on the same post.*

Wigwag Signals.—The following provisions relate to the design of wigwag signals:

1. *A wigwag signal shall consist of a disk 20 inches in diameter, in the center of which a lamp with red lens or roundel is provided for night indication.*
2. *The disk shall be supported by a pivoted rod and the length of stroke of the swinging light in the disk measured horizontally between extreme positions shall be 30 inches.*
3. *Lenses or roundels shall be a minimum of 5 inches in diameter, and shall be in accordance with Signal Section Specification 69 of the Association of American Railroads.*
4. *The Railroad Crossbuck sign (Section 89) and the signal shall be mounted on the same post.*

Automatic Gates.—The following provisions relate to the design of automatic gates:

1. *An automatic gate used for the protection of highway traffic at a railroad-highway grade crossing, when indicating the approach of a train, shall present toward approaching highway traffic the aspect of an arm equipped with red lights being lowered across the lane or lanes used by traffic approaching the crossing, or at rest in the horizontal position across the lane or lanes.*
2. *An automatic gate, when installed, shall serve as an adjunct to a highway crossing signal.* It should be mounted on the same assembly as the flashing light signal; however, where conditions require it may be mounted on an independent pipe post or pedestal located between the signal and the track.
3. *The bottom of the gate arms, when in the horizontal or lowered position, shall be not less than 3½ feet, nor more than 4½ feet above the crown of the roadway and, when not indicating the approach of a train, shall neither obstruct nor interfere with highway traffic.*
4. *Each gate arm extending over the highway shall have three red lights shining in both directions along the highway. The light nearest the tip shall burn steadily* and the other two lights shall flash alternately.
5. *The gate arms shall be painted on both sides with 16-inch alternate diagonal stripes of white and black.*
6. *Lenses shall be in accordance with Signal Section Specification 69 of the Association of American Railroads.*

Insofar as practicable, the mechanisms should be so designed that if the arms, while being raised or lowered, strike or foul an object, they will readily stop and, upon removal of the obstruction, assume the position corresponding with the control apparatus.

"No Right Turn" and "No Left Turn" Signals.—The following provisions relate to the design of "No Right Turn" and "No Left Turn" signals:

1. *The aspect shall be that of an illuminated sign bearing the legend "No Right Turn" or "No Left Turn" surmounted by a flashing yellow marker light.*
2. *The sign shall be in accordance with Association of American Railroads Signal Section Specification 231.*
3. *The marker light shall be in accordance with Association of American Railroads Signal Section Specification 190 or 232, except to display yellow and arranged for fastening to bracket.*

Section 300.—*Location*

One signal or one gate shall be placed on each side of the track, except in the cases of established one-way streets, where the installation shall be made on the approach side. Signals and gates shall preferably be placed on the right of approaching traffic.

The location of signals and automatic gates for railroad-highway grade crossing protection should be determined after inspection and study at the site. In addition to providing for adequate clearances, consideration should be given to the type of highway, angle of crossing and visibility to drivers approaching the crossing.

The "No Right Turn" or "No Left Turn" signal, when used, should be placed to the right of the parallel highway approaching the crossing and as close to the intersection as practicable.

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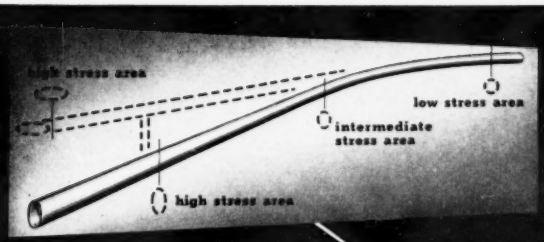

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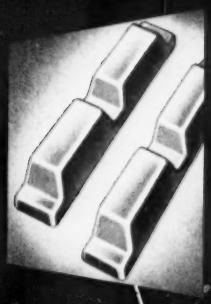

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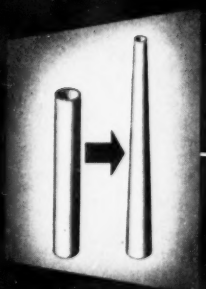

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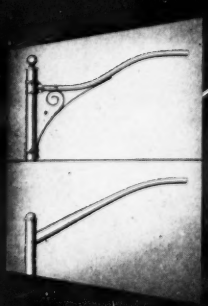

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Section 301.—*Installation*

Signals and gates shall be installed in accordance with the standards and practices recommended in Railroad-Highway Grade Crossing Protection Bulletin No. 4 (or subsequent issue), Association of American Railroads, Joint Committee on Grade Crossing Protection (now Train Operation, Control and Signals).

Section 302.—*Operation*

Automatic crossing signals used to indicate the approach of trains shall so indicate for not less than 20 seconds before the arrival of the fastest train operated over the crossing. Circuits for the operation of automatic gates shall be so arranged that the gate arm shall start its downward motion not less than 3 seconds after the signal lights start to operate. The gate arm shall reach full horizontal position before arrival of the fastest train operated over the crossing and shall remain in that position until the rear of the train has cleared the crossing.

Local conditions may require an operating time longer than 20 seconds before arrival of the train, but too long an operation by slow trains is undesirable. Uniform time control for all train speeds is the most desirable arrangement, and at crossings where there is considerable difference between high and low train speeds and where travel on the highway is heavy, provision for a type of circuit control that will insure equal or approximately equal timing should be considered.

Electric lamps in the flashing light type of signals shall flash alternately. The number of flashes of each electric lamp per minute shall be 30 minimum, 45 maximum. Electric lamps shall each burn approximately the same length of time. Total burning time of both electric lamps shall be practically the entire operating time.

Each flashing light unit shall have range in accordance with Signal Section Specifications 190 or 232 of the Association of American Railroads.

With the wigwag type of signal, movement of the swinging disk from one extreme to the other and back constitutes a cycle. The number of cycles per minute shall be 30 minimum, 45 maximum.

The electric light unit of the wigwag signal, when the disk is suspended vertically, shall have a range, at night, of 1500 feet through a total angle of not less than 20 degrees when a 10-watt lamp rated at 1000 hours is burned at rated voltage. The lamp shall burn while the disk is swinging.

The "No Right Turn" and "No Left Turn" signal sign shall be legible only when the crossing signal indicates the approach of a train. It shall be illuminated without flashing during the period that the crossing signals are operating, and the yellow marker light shall flash in synchronism with the crossing signals.

Section 303.—*Maintenance*

Automatic signals and gates shall be kept well painted and in a good state of efficiency. The surfaces of lenses on signal and gate arm lights shall be kept free from such deposits as soot or other materials, since these will seriously affect their efficiency.

Part IV of the Manual deals with the design and application of *Islands*, mostly in a rather general and advisory way. The Joint Committee made numerous recommendations for improving this Part by changes in emphasis, clarification, or amplification. Most of these were hardly controversial, and, with a single exception, are cited here without recommendations for detailed textual revisions.

27. Section 312 to emphasize that Part IV is not intended to serve as a design manual, and to refer to the "policies" of the American Association of State Highway Officials for guidance in design standards.

28. Section 313 to include a mention of the effect of parking, with a suggestion that it be prohibited adjacent to islands, where it is usually unsafe.

29. Section 328 to include a reference to left turns by vehicular traffic as an element to be considered in determining whether traffic is to be permitted to pass to the left of loading islands.

30. Sections 336 and 341 to include mention of "jiggle bars" as a protection for refuge islands.

31. Section 337 to avoid the implication that certain features of a continuous median are necessarily "disadvantages."

32. The only change in a mandatory specification in Part IV is a revision of the first paragraph of Sec. 338 to provide for a greater length for refuge islands, substantially as follows:

Length and Width—Refuge islands shall be at least 4 feet and preferably at least 6 feet wide. The length along the roadway shall not be less than 10 feet nor less than the width of the crosswalk, with additional length as required for visibility and end protection.

33. Section 346 to add a fifth "function," to cover narrow islands installed at the edge of the traveled way to separate through traffic from that slowing down or stopping on an auxiliary lane such as a bus stop or median lane.

34. Section 351 to avoid the controversial question of specific curb designs, stating only in general terms that when curbs are used they should be designed in accordance with the needs of the situation, giving consideration to speeds, median width, pedestrian protection, etc., and including a reference to AASHO "policies."

35. Section 352 to omit, in its last paragraph, the specific dimension for the "nose" of a divisional island, and to make reference to AASHO "policies."

36. Table 3, on page 201 of the Manual to be revised to conform with the recently revised "policies" of the American Association of State Highway Officials.

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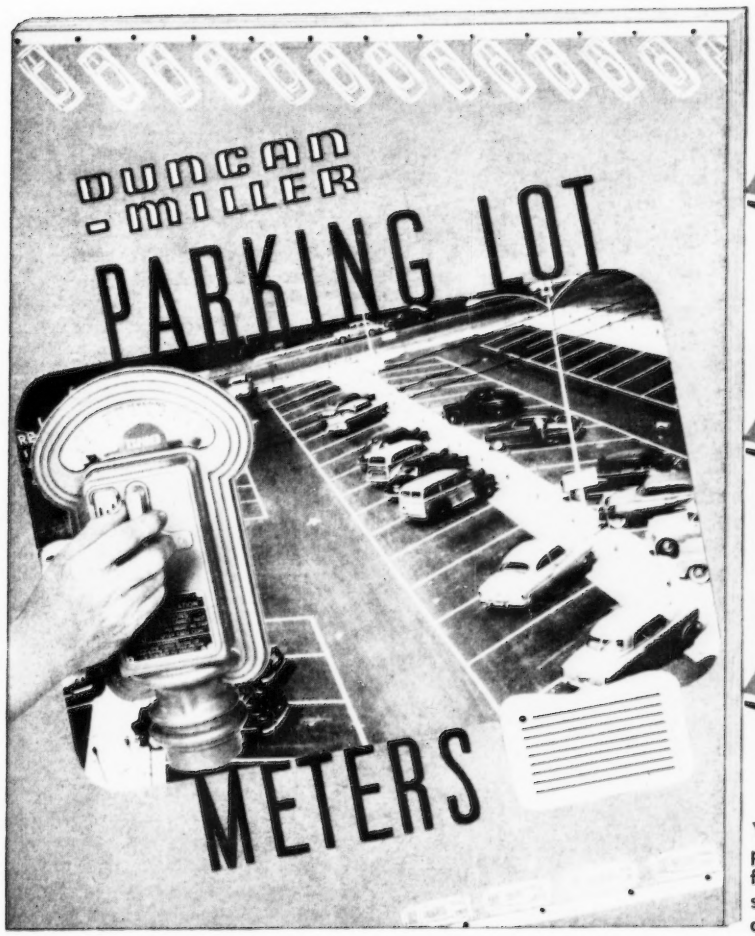

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TRAFFIC NEWS

11 European Countries Send Traffic Observers To United States

Thirty-two representatives of eleven European countries arrived in the United States April 9 to begin an intensive two-month study of traffic and methods of improving its movement. The trip is being made under the auspices of the United States Foreign Operations Administration in collaboration with the Organization of European Economic Cooperation and the various countries concerned.

Members of the observation mission, originally proposed by International Road Federation, were selected in many instances through recommendations of national roads associations in cooperation with the interested governments. The mission, which visited Washington April 10 to 15, was given a reception by IRF and attended lectures provided by various highway and traffic organizations and the U. S. Bureau of Public Roads. Field trips were made April 16 to Arlington County, Virginia and April 17 to New Haven, Connecticut. There, the group attended a special course at the Yale Bureau of Highway Traffic from April 19 to 30.

Group Divides into Three Sections

On May 1, the group was divided into three sections, each to spend two weeks studying conditions in a major city until May 14. They rejoined May 17 in Chicago at which time a field trip was made in that city. From May 19 to 25, members of the mission will attend seminars at the Institute of Traffic at Northwestern University, Evanston, Illinois. They return to Washington, May 26, where an evaluation will be made of the observations and reporting sessions conducted to June 1. Departure date for returning to their homes is scheduled for June. 2.

Atlanta: Host, Karl A. Bevins—Charles Boulesteix (*France*), Chief Engineer of the town of Paris—Chief of the Technical Central Office of the town; Koert Muller (*Netherlands*), Chief Inspector, Head Traffic Police, Rotterdam; Alighiero Bottaro (*Italy*), Ministry of Transport, General Superintendent on Motor Vehicles and Public Transport.

Cincinnati: Host, George W. Howie—Willi Stoll (*Germany*), Consultant of the Bavaria Ministry of Interior for Traffic Safety of Land Bavaria; Maurice-André Cagnard (*France*), Police Superintendent; John Duff, (*United Kingdom*), Electrical Engineer, Traffic Engineering Branch.

Dayton: Host, J. A. Carrothers—Ernest Gerlach (*Germany*), Professor at the Technical University of Berlin; George Charlesworth (*United Kingdom*), Principal Scientific Officer, Department of Scientific & Industrial Research, Roads Research Laboratory, Harmondsworth, Middx.; E. Egebo (*Denmark*), Département des Ponts et Chaussés Danois.

Detroit: Host, A. F. Malo—André-Louis Allezaix (*France*), Asistant of Préfet de Police, Paris; Jacques Ricquier (*Belgium*), Managing Director of Jaric Publications, Brussels; Aage Andersen (*Denmark*), Département des Ponts et Chaussés Danois.

Grand Rapids: Host, Jerome D. Franklin—George Hole (*United Kingdom*), Assistant Secretary, Ministry of Transport and Civil Aviation; Jean-Louis Biermann (*Switzerland*), Technical Collaborator on the Swiss Consulting Office for the Prevention of Accidents, Berne; Marius Le Cosquino de Bussy (*Netherlands*), Chief Engineer-Director, Chief of Roads Section of General Directorate of Rijkswaterstaat (Ministry of Transport and Waterstaat).

Kansas City: Host, T. J. Seburn—Friedrich Riechenberg (*Germany*), Senior Highways Engineer, Department of Traffic Operations; Pierre Doyen (*France*), International Road Federation Paris Office, Technical Manager; Henry Dalton (*United Kingdom*), Assistant Commissioner, New Scotland Yard; Cornelis Kuysten (*Netherlands*), Head Traffic Department of the Royal Dutch Touring Club.

Milwaukee: Host, Howard F. Ilgner—Elmar Oehm (*Germany*), Head of Municipal Department for Underground Works, Essen City Administration;

(Continued on next page)

Howard Wins "Getting Results" Contest

A traffic control program that produced a 67 per cent reduction in accidents through the installation of adequate warning devices at a hazardous intersection in Jacksonville, Fla., was voted the best example of traffic engineering results submitted to the Association of Casualty and Surety Companies in its 1953 competition for traffic officials.

First prize of $100 was awarded to Harry Howard, Jr., Jacksonville traffic engineer, for his entry in the Association's fifth annual "Getting Results Through Traffic Engineering" contest. It showed how a serious accident problem, which had caused injuries to 13 persons and property damage of $14,160 in 11 months had been solved by the use of a flashing beacon, guide lines, guard rails and reflectorized "stop" signs costing only $255. As motor vehicle accidents dropped from 12 to four in a comparable period following the installation of these devices, only three persons suffered injuries, a reduction of 77 per cent, and property damage costs fell to $3,745, a reduction of 73 per cent.

Mr. Howard's highly successful project was one of more than 120 examples of traffic engineering published by the Association's accident prevention department during the last 15 years to guide safety engineers and officials in ways to reduce the toll of deaths, injuries and property damage in highway accidents. Through these case histories, sent without charge to more than 3,000 key officials interested in safety, traffic engineering know-how has been put to work on a broad scale in thousands of cities and on rural highways.

Among other examples published last year in the Association's accident prevention department bulletins, "Getting Results Through Traffic Engineering," were several plans that cut the accident totals in half.

Channelization and signal changes introduced in Charlotte, N. C., by Herman

(Continued on next page)

EUROPEANS VISIT

(Continued from page 294)

Galeazzo Raspoli (*Italy*), City of Rome, Special Office for the New Town Plan, assignment; town planning specialist; Dag Blomberg (*Sweden*), Chief Inspector, Royal Board of Roads and Waterways, Stockholm.

Norfolk: Host, H. H. George, 3rd—Jens Johansen (*Denmark*), Ingénieur voyer; André Schul (*France*), Chief Engineer of Bridges and Roads, Marseille; De Rossi, (*Italy*).

Pittsburgh: Host, Michael J. Gittens—Wilhelm Klingenberg (*Germany*), Director of Engineering, Federal Ministry of Transport, Bonn; Maurice de Rouville (*France*), District Engineer, in charge of Division of Planning and Surveys for the Alpes Maritimes District; Ivar Ramstad (*Norway*), Chief of Communication Section of Oslo Town Planning Office.

Providence: Host, Roger Chandler—Erich Plaschke (*Germany*), Government Surveyor of Works, Head, Department of Road Traffic, Board of Trade and Transport; Sedat Mengiliboru (*Turkey*), General Directorate of Highways, Traffic Safety Division Chief; Vincenzo Cusani (*Italy*), Rome Municipal Tramways and Motor Buses; Thor Johne (*Norway*), Superintendent of Police, Oslo.

Travelers Company Releases Traffic Statistics

The worst automobile accident toll in the nation's history—more than two million casualties—was recorded in 1953, according to figures released by The Travelers Insurance Companies.

Traffic deaths totaled 38,500, an increase of 900 over 1952. The injury count reached 2,140,000 compared to 2,090,000 for the previous year.

The totals are statistics from "The Passing Scene," twentieth in an annual series of traffic accident data booklets published by The Travelers. Accident facts from every state in the country are collected and analyzed for the publication by Travelers statisticians.

Excessive speed was the most dangerous driving mistake in 1953. Speed killed 13,870 persons and injured more than 600,000. Drivers under 25 years of age were involved in almost 25 per cent of the year's fatal accidents although they constitute only about 15 per cent of the total of all drivers.

Week end crashes accounted for 15,800 killed and 800,000 hurt during 1953. Forty-one per cent of the deaths and 36 per cent of the injuries occurred on Saturdays and Sundays last year.

HOWARD WINS

(Continued from page 294)

J. Hoose, traffic engineer of that city, made possible a much freer traffic movement at a busy intersection and reduced accidents 64 per cent.

In Los Angeles, Cal., traffic engineer R. T. Dorsey showed how skidding accidents could be lessened 59 per cent, by grooving the road surface to produce a non-skid pavement. As accidents dropped, the number of persons injured declined from 107 to 27, a 75 per cent reduction.

W. H. Mann, traffic engineer of Nashville, Tenn., submitted a description of channelization and one-way street patterns that led to a 44 per cent shrinkage in the amount of accidents. Compared with 25 accidents and nine personal injuries before the plan was adopted, only 14 accidents involving two personal injuries occurred after the change was made.

In the Association's annual competition, open to all traffic engineers and highway officials and others interested in improving traffic safety, major factors considered by the judges include effectiveness of a project in reducing accidents and traffic delay or congestion, and relationship of the value of benefits to the cost of the improvements made.

Judges of the 1953 competition were representatives of leading organizations interested in traffic safety: American Association of State Highway Officials, J. Carl McMonagle, director, planning and traffic division, Michigan Highway Department; International Association of Chiefs of Police, Carl F. Hanson, Chief Police Dept., Dallas, Texas; Institute of Traffic Engineers, Edward G. Wetzel, Asst. Chief Planning Division Port of New York Authority; National Safety Council, David M. Baldwin, director of its traffic and transportation division, and Yale Bureau of Highway Traffic, Theodore M. Matson, director.

The Association will make a similar $100 award next year for the best case history among the examples published during 1954. Entries should be sent at any time during the year to the Accident Prevention Department, Association of Casualty and Surety Companies, 60 John Street, New York 38, N. Y. Robert J. Allen, the Association's chief traffic engineer, is in charge of the competition.

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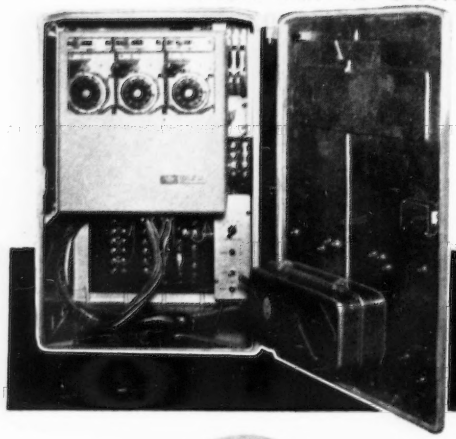

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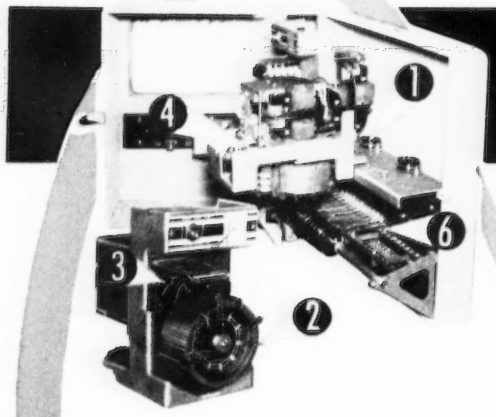

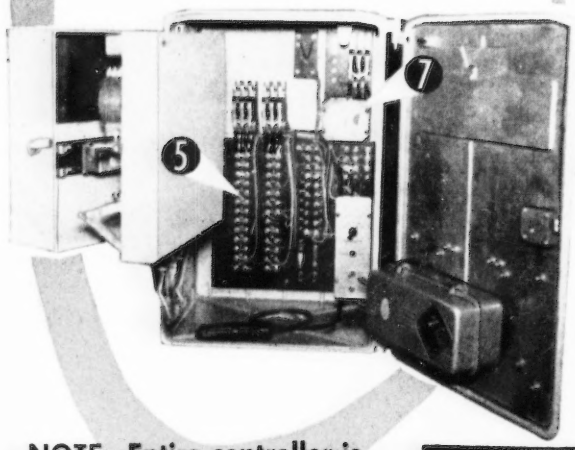

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Miscellanea

Everybody reads the accident toll records, glances at the safety warnings and deplores the killing and maiming on the highways, yet still we are able to produce appalling statistics that should never be. . . . 1953 brought us a ferocious automobile accident toll . . . 38,500 people killed, 2,140,000 injured . . . deaths up 900, injuries leaped by 50,000 over 1952 . . . speed killed the most, 13,870, injured 600,000 . . . three out of four auto accidents happened in clear weather, etc., etc.

A man failed his driving test after rolling through three stop signs . . . he apologetically explained that he had just manufactured 8,000 stop signs and warning markers for the Oklahoma Department of Public Safety. . . . Woody Rankin, TE of Wichita, got a letter the other day . . . it seems a considerate woman had parked opposite one of Woody's broken meters, for in the letter was the undeposited nickel and instructions on where to find that broken meter. . . .

Announcements, reports, and statements overheard in passing . . . Robert A. Mitchell resigned from his position as Chief, Traffic Engineering Division, Gannett, Fleming, Corddry, and Carpenter, Inc., Engineers, Harrisburg, Penna., to accept the job as Traffic Engineer, Wilmington, Delaware . . . Bob's

Robert A. Mitchell

write-up was included in the February, 1951 issue of TRAFFIC ENGINEERING when he joined the Gannett, Fleming firm. . . . he went there from the Bureau of Traffic Engineering, Philadelphia, Penna. . . . in March he visited Medellin, Colombia, South America for the Harrisburg Company, to make a study of their bus transportation system and traffic problems in order to present a report for improving both their transit and traffic conditions. . . . Douglas Binns has been appointed Assistant Traffic Manager in the Port Development Department of the Port of New York Authority. . . . Dave Morris of Tacoma, Washington, has left the city to work for a northwest contracting firm, rumor reports. . . . Another rumor says the Office of Wilbur S. Smith and Associates, New Haven, will soon take on two new expert and experienced traffic analysts . . . this means that their office will have a very strong Yale Bureau contingent, in fact it will be 100 per cent. . . . Fred L. Bell, formerly of the Florida Highway Department, announces the opening of the offices of Frederick L. Bell & Associates, Consulting Engineers . . . mailing address, 201 S. Franklin Boulevard, Tallahassee, Florida. . . . DeLeuw, Cather & Company, Engineers, of Chicago, announced the opening of their new branch office in Canada . . . Joining their organization is H. William Tate, formerly assistant General Manager, Toronto Transit Commission, who will be Executive Vice-President Toronto 7, Canada . . .

The well-known conservative Coverdale and Colpitts is now 50 years old . . . it has made more than 350 traffic surveys in at least thirty-four states . . . originally an industrial as well as a railroad engineering consulting group, their traffic work took an upswing after World War II, when the toll highway interest grew . . . George W. Burpee, senior partner, heads firm today . . . the founders having died several years ago. . . .

Headline may well read: City Goes Into Parking Lot Business . . . at least it looks that way . . . April 17th was the official opening of the Flushing Parking Field, Flushing, Queens, New York City . . . a 770-car lot to be operated by by the New York City Department of Traffic. . . .

Comments taken from an article about yesterday's "Highway of Tomorrow"—today's bottleneck north of New York, Westchester County's Parkways . . . quote . . . "The first recommendations made by the engineers calls for reconstructing the Hutchinson River Parkway at a cost of $35,326,000. The Parkway originally cost only $8,049,000, including land, grading and paving. . . . And these bonds will not be fully paid until 1980 . . . parts that are serpentine, have steep grades, lack center islands, and do not have six or eight lanes . . . Wilbur Smith & Associates, New Haven, Conn. . . . specialists on traffic problems . . . Edwards, Kelcey & Beck, New York, specialists on remedies . . . were retained to plan the remodeling . . . Hutch is indicted because of its curves, grades and

(Continued on next page)

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SECTION NEWS

New York's Metropolitan Section

held their seventh meeting recently with President Strickland presiding . . . items of importance included mention of New York's 24th Annual Safety Convention, held the first week of April. Outstanding personalities contributing to the program being Dwight Meyers of New York City and Henry Osborne, Buffalo. . . . Ed Ricker has been appointed chairman of the nominating committee with Ed Cyr and Ed Wetzel to serve as assistants . . . speaker of the evening was Arnold Vey, Director of the New Jersey Bureau of Traffic Safety . . . subject, Traffic Problems in Connection with Drive-in-Theaters, Shopping Centers, Auction Markets, etc., Contiguous to Heavily Travelled Highways. . . . Sec'y-Treasurer Herb Klar reported foregoing. . . .

Michigan Section

Italian spaghetti on the menu with Barney A. Cyberski, program chairman . . . included magic show, and Mr. Paul Shoemaker of Capitol Air Lines, who spoke on the history and progress of aviation . . . Entertainment was supplied by McMonagle's "Concrete Mixers." . . . President Sam Levine presided, receiving reports from Ed Gervais, Secretary-Treasurer, and Carl McMonagle on the Michigan Traffic Safety Conference, held in Detroit April 20-22. . . . Gervais reported on this March 30th meeting held in Lansing. . . .

Washington, D. C., Section

April 7th, Army & Navy Club, President Gravelle in charge . . . John Mitton, Chairman of the Tellers Committee, reported following election results . . . President, Henry Evans . . . Vice-President, Burt Sexton . . . Secretary-Treasurer, O. K. Normann. Congratulations to the new slate. . . . John Mitton, also a Delegate to the W. C. Council of Engineering and Architectural Societies, reported on their activities:

. . . United Engineering Trustees, Inc. —Mr. Mitton reported on a request from the Council for a member of the Washington Section to participate in the Council committee action to foster the move to bring the headquarters of the several engineering groups to Washington. President Gravelle appointed Mr. Mitton to serve in this capacity . . .

. . . Citizens Zoning Advisory Committee—Mr. Mitton reported that the

(Continued on page 300)

MISCELLANEA

(Continued from page 297)

capacity . . . in alignment, 48 per cent of the entire length is declared deficient, while 100 per cent lacks good shoulders, proper access roads and efficient center islands. . . . A lack of adequate vertical sight distance was noted at twenty-four places in each direction . . . excessive curves were noted at thirty places in each direction. . . . An almost continuous succession of reverse and compound curves was especially condemned . . . all this added up to a finding that a speed of only 25 miles an hour now is safe on the Hutchinson, although 40 is permitted and cars generally go faster . . . a good four-lane highway, which the Hutchinson is not, should handle 2400 cars an hour safely in each direction. . . . The Hutch now exceeds this load by 44 per cent and will exceed it by 105 per cent in 1958 and by 165 per cent by 1970. . . ."

The star studded Fifth Highway Transportation Congress, Mayflower Hotel, Washington, D. C., May 4-5-6, 1954, will present a panel—"the City Traffic Muddle—What Exit?" . . . Comprising the panel are . . . Henry Barnes, Director of Traffic, Baltimore, Md., traffic solving expert . . . Glenn Richards, Director, Public Works Department, Detroit, Michigan, national authority on municipal highway matters . . . D. D. Greer, Texas State Highway Engineer, experienced highway official in the field of city-state government cooperation in meeting the urban traffic problem . . . David L. Lawrence, Mayor of Pittsburgh, Penna., Pennsylvania's first citizen, who is leading a big city out of its own traffic dilemma . . . and William Lampe, Editor in charge of Hearst Better Roads Campaign. . . .

The Yale Bureau students are now hard at it with their theses on the home stretch . . . recent excursions have included trips to Automatic Signal in Norwalk; Eno Foundation and a talk by Resident Traffic Engineer, R. E. Schmidt. . . . Port of New York Authority and New Jersey Turnpike in April. This semester's officers were J. M. Hunnicutt, Jr., Chicago Bureau of Street Traffic, Chicago, Illinois; Vice-President, Major Walter Hibbard, Office of Chief of Transportation, U. S. Army; Secretary, Duaine T. Evans, Louisiana Dept. of Highways, Baton Rouge, Louisiana; Treasurer, Arne J. Gotterod, Public Roads Administration, Oslo, Norway . . . Chaplain, M. J. Hartigan, City of Chicago, Illinois. . . .

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Section had been requested by the Council to submit names of one or two persons for appointment to the Citizens Zoning Advisory Committee of the District of Columbia. The delegates of the Council will then select three names for forwarding to the Commissioners. . .

The Secretary called the membership's attention to Article II — Membership, Part 2, as follows:

> "A Local Affiliate, at the time of admission, shall be a person who is either contributing substantially to the advancement of traffic engineering profession, or is engaged in professional work in a closely allied field, in which he shall have been engaged for at least 5 years. At no time shall the number of Local Affiliates exceed one-half of the number of Institute Members in the Washington Section."

It was stated that this form of local membership had not been actively used and a method was presented to the Section of affiliating a considerable number of local people with the Section. It would also add to the regular income of the Section. Each member was urged to submit names to the Secretary for consideration by the Executive Committee. . . .

An open discussion of Traffic Management in Cities followed, with President Gravelle serving as moderator. . . .

Burt Sexton, Secretary-Treasurer, reported the foregoing. . . .

Midwest ITE-MS

City Planner, Frederick T. Aschman of the Chicago Plan Commission, presided over a round-table discussion at the April meeting . . . University of Illinois students from student chapter also in attendance . . . subject, Traffic Engineering as related to City Planning . . . Second Annnual Safari to Milwaukee and a Braves-Cubs ball game is well under way . . . Chicago contingent reserved Greyhound's Scenic Cruiser . . . demand for tickets greater than supply . . . IMSA of the Mid-West held their Annual Meeting in Chicago with General Chairman of the three-day conclave of signal engineers being ITE's Ralph Michel . . . included in program were sessions on communications, electrical cable, street lighting, and traffic signals . . . Chicago traffic men attended the session on planning, operations, and maintenance of street lighting and traffic signals . . . special item in this issue was "amble scramble gets boot in Milwaukee" . . . Milwaukee's common council acting with unusual alacrity last month (March) sounded the death knell on the six month trial of the "Barnes Dance" at four downtown intersections. . . . The mayor, the director of the safety commission and the traffic engineer concurred with the 26-0 decision. . . .

Western ITE

The ITE dinner honoring Ralph T. Dorsey on the occasion of his retirement attracted 172 ITE members and friends to the Hollywood Roosevelt Hotel. Among those in attendance was Glenn S. Paxson, who brought greetings and best wishes for Ralph from the northwest area. Ralph Luckenbach speaking for the ITE membership, presented Dorsey with a camera; Don Berry, representing the Western Section, handed him a framed proclamation expressing our sentiments. Harry Porter, Vice-President of the Institute of Traffic Engineers, was principal speaker of the evening. His thought-provoking discussion of traffic engineering needs of small communities was received with a great deal of interest.

The Oregon State Highway Commission has notified all cities and counties that the red "STOP" sign is now the standard for Oregon. All stop signs installed hereafter are to be red. The Washington Highway Department adopted the red "STOP" sign last December.

Ellis Mathes has joined the "I've got a 1033" club with a new installation at Capitol and College in Boise. The intersection has five entering streets plus two left turns.

Seattle's Sawhill, Mills and Richardson just completed a tour into Oregon looking for comparative parking meter operation costs. Seems they have a bid coming up for new meters.

Operation "big switch" which has just reshuffled Colorado's state, city and county road systems and created new spheres of responsibility for traffic control and maintenance has induced a strong magnetic field of close-working relationships among state and city traffic engineers and officials. The job of resigning these road systems and especially the future prospect of uprooting approximately 50,000 Stop signs around the state and giving them a rosy-red complexion may draw this same team even closer together in the form of a mutual defense league.

Newark Traffic Problems

Editor's Note: The following article has been prepared for TRAFFIC ENGINEERING *by Mr. Edward Cyr (Mem., ITE).*—EDITOR.

Increasing traffic once meant better business, but today in Newark, N. J., as in municipalities throughout the nation, increasing traffic has produced congestion with resultant hazards to both business and motorists.

Early in 1953 it was apparent that unless new traffic control devices were established to expand and improve parking and movement facilities for trucks, buses and automobiles through the heart of Newark the commercial district eventually would suffer a severe loss of business.

Newark Traffic Engineer Edward L. Cyr (left), and Assistant Traffic Engineer Allen J. Dowd check one of the new reflectorized parking control signs. The three messages on the sign are clearly visible a block away during hours of darkness. The regulations are marked on both sides of the sign.

In Newark the relationship between traffic congestion and accident was so close that the two were inseparable and both were weighed in seeking remedies.

Our problem was three-fold and changes in parking control ordinances were needed to: (1) Move a daily volume of 65,000 vehicles more rapidly along arterial routes all of which pass through the heart of the city containing Broad and Market Streets, *the second busiest corner in the world.* (2) Improve facilities for loading and unloading merchandise or passengers. (3) Restrict customer parking without hurting business.

It was clear that the more easily we moved vehicles and pedestrians, the better living conditions and business would be for all concerned. We needed modern traffic control techniques that would protect property values, save time, and move produce and merchandise more quickly and cheaply.

In working toward these goals, the Newark Commission in June, 1953, passed an ordinance which concerned parking in the central business area and on arterial streets leading to the area.

This progressive step in traffic control provided that there would be no standing during the a.m. and p.m. rush hours and that there would be no parking extended into the mid-day providing for truck loading and unloading, and that there would be parking only during certain other periods of the day.

These rules apply to an area approximately 25 blocks by six blocks and arterial highways that are three to five miles long leading into the city.

The new ordinance meant that the city would have to install some 6,000 signs indicating the law under the new ordinance and the these 6,000 signs would have to be up by the end of the year.

We were faced not only with the problem of finding a light weight sign that would do the work of three signs in one with the message brightly visible day and night, but a new method of production was needed. It was impossible to produce the number of signs needed under old production methods.

The signs would have to be readable to motorists from either direction, and for effective enforcement should be reasonably close together, never more than 75 feet from the parker's curb space—thus never more than about 150 feet apart.

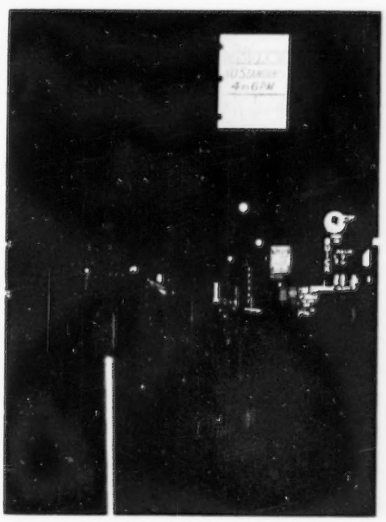
This problem of making three signs in one with new production techniques was solved by selecting aluminum signs covered with silver Flat-Top "Scotchlite" brand reflective sheeting on which is silk screened the legend in two or three colors.

The top third of the sign has red background with silver lettering, the middle third in silver with red lettering and the bottom green with silver lettering. The signs measure 18"x24". At night this reflective sheeting makes the entire sign visible in full color more than a block away.

After becoming familiar with the signs, the motorist knows that all he has to do is look at the green to tell when he may park.

To speed the traffic flow along the arterial routes and through the bottleneck formed by the streets coming into the heart of the city, reflectorized "No Turn" signs were installed at more than 100 intersections.

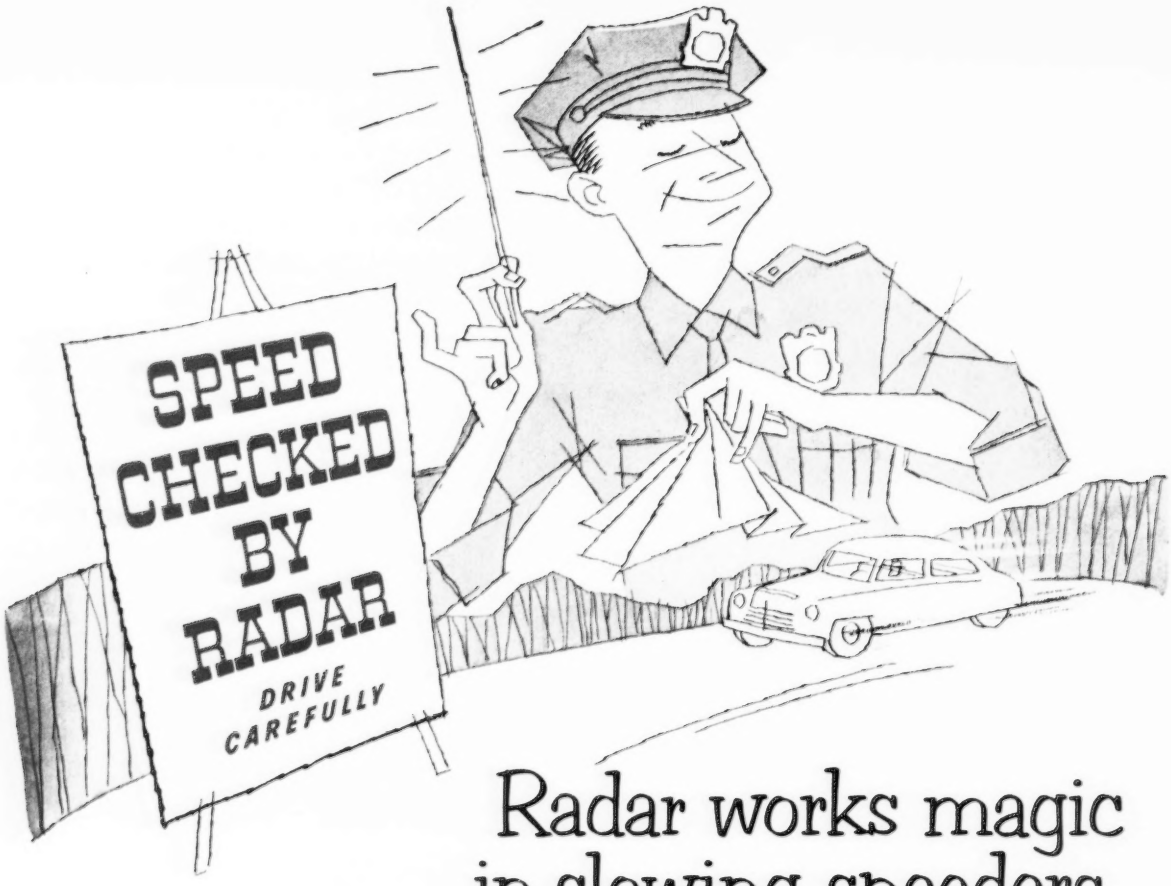
This type of sign is suspended below a trombone arm which carries the red and green and amber Stop and Go signals. Previously, the "No Turn" signs were sandwiched between the two parallel horizontal arms of the trombone bracket.



Typical night shot of the colored reflectorized parking control sign. The sign is shown here near Broad and Market Streets, the second busiest intersection in the world. A daily volume of 60,000 vehicles pass through the intersection.

However, the occasional hurricanes that hit this part of the coastline damaged the sign in this position. Now, supported merely by four aluminum brackets, allowing the sign to swing freely in the wind, the signs have withstood repeated hurricanes without damage.

Also to be reflectorized are 1,500 new "One-Way" signs for improved day and night traffic control on the 175 one-way streets most of which were created since



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The Electro-Matic® Model S-2 Radar Speed Meter operated by law enforcement officers provides a safe, positive means of detecting and controlling speeders. Violators soon discover the magic of radar equipment accurately indicates their excessive speed to the police-operator. Enforcement officials find many advantages in using the Speed Meter: Checks far more vehicles than a cruiser car • Eliminates hazards to pursuing officers and to motorists • Effective day and night and in all weather • Psychological deterrent to would-be speeders • Portable for spot checking • Ideal for investigating complaints of neighborhood speeding • Either one man or two-man usage of the Speed Meter can be employed. FOR FULL DETAILS WRITE FOR BULLETIN R-102.

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World War II to help solve the increasing traffic congestion problems in this city where due to hills and railroad tracks, streets have no choice but to flow largely down to one center like branches of a river coming down to the main river.

In addition to Speed Limit Signs, other forms of reflectorized traffic controls at each of 600 principal intersections include reflectorized cross walks and stop lines.

The use of reflective sheeting production methods has resulted in an economy of at least 20 per cent in the initial cost of signs. This includes signs completed and not yet installed. A further economy is gained in installation because fewer man hours are needed to install the lighter weight signs.

Previously, the signs were made of boiler plate and required a processing procedure of seven steps:

1. Prime coat.
2. First Paint coat.
3. Second paint coat.
4. First screening of the message.
5. Second screening of the message.
6. Clear coat.
7. Erection on street.

In addition to the fact that one man could carry only about five of the old type iron signs as compared to 25 of today's signs, the methods of production by use of *"Scotchlite"* smooth-surfaced reflective sheeting have been cut to four.

1. Aluminum and reflective sheeting bonded together and first color message applied in one day.
2. Second color message applied second day.
3. Clear coat on third day.
4. Erection of sign on fourth day.

With one man carrying twenty-five of the new light weight aluminum signs there is a considerable saving in manpower since previously it would in effect require five times as much manpower to carry the same number of signs and erect them.

This all reflectorized program to help remedy congestion also has been applied to control devices in residential districts and to mark Newark Civil Defense Emergency Routes.

In residential districts strips of reflective material on parking meters measure 3"x24" on the approach side with two inch letters giving the rules and hours of parking.

This has reduced vandalism on such signs, as the economic advantage of the need for suspending off the parking post an extra sign which might injure pedestrians who brush against it.

The benefits derived from the traffic control ordinance are evident throughout the city.

Traffic movement at night, with the inexpensive night-time "No Turn" sign, has increased the capacity of one-way streets approximately 25 per cent.

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Patent Pending

ALL-RUBBER TRAFFIC GUIDES

Wherever traffic control becomes difficult . . . during rush hours, street repair or emergency, these big, "steel-like" rubber traffic cones demand motorists respect. Available in two sizes, 18 inch and 28 inch, painted or reflectorized.

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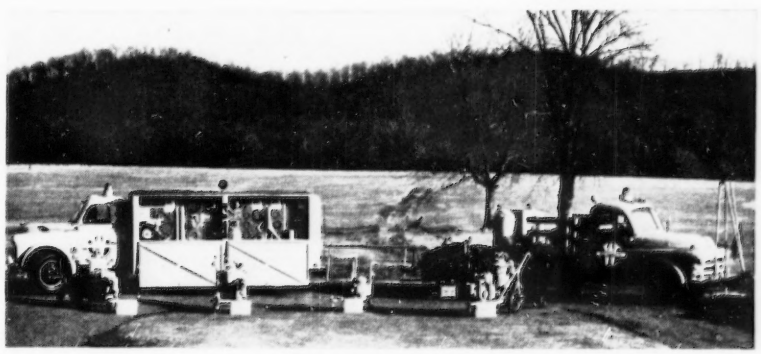
Wald Equipment On Parade

Shown here is the equipment which Wald Industries, Inc., Huntingdon, Pennsylvania, manufacturers of traffic marking machines, is using in its nation-wide demonstration tour, known as "Operation Reflecto-Liner."

The comprehensive accessory display includes Wald's Skip-liner, which may be attached to any Reflecto-Liner, and the Outboard Attachment for spraying curbs—parts which lend outstanding versatility to Wald marking equipment.

Also on display are the Models 16, 12 and 8T Reflecto-Liners, the new Reflecto-Liner Jr., and Model 345 Truck-O-Liner, which is specifically designed for extensive street, highway and airport centerline marking. Purpose of the tour is to demonstrate new striping techniques, showing the machines in the actual operation of applying marking materials for municipal and industrial use.



New Type Lighting Standard

Shown in the accompanying photograph is the new "Elite" Octa-Tube lighting standard made by the Millerbernd Manufacturing Co. of Winsted, Minnesota. According to company engineers, the new base and mastarm designs greatly simplify wiring, enable the use of a lower-cost lamp-ballast, and better withstand impacts and vibrations. The

shafts are cold-roll-formed of Extra-Strength steel. As many as 20 parts have been eliminated in the "Elite" design, resulting in substantial savings in instllation and maintenance. The company has prepared a new booklet OTA, which gives full information on the entire line.

Sy-Loy Will Last

SY-LOY, a remarkable new plastic sign reported to "last for a lifetime" without maintenance or repainting, is jointly introduced by The General Tire & Rubber Co., and Municipal Street Sign Co., Inc. The new sign won't break or rust and is available plain or reflectorized with background colors permanently molded into the plastic.

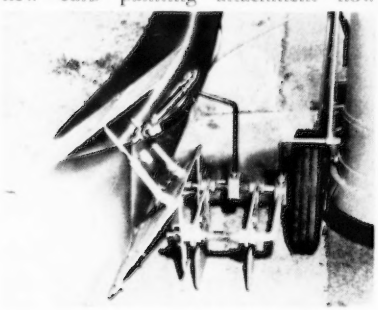
Reinforced with tough fiberglas, fused under intense heat and pressure with weather and age-resistant polyester resins and pigments, the lightweight SY-LOY traffic sign is flexible, and always returns to its original shape. It is made in all sizes with standard legends. The new 24″x24″ or 30″x30″ white on red plastic STOP sign is also offered, and is fully reflectorized for 24-hour visibility.

For the new illustrated SY-LOY brochure, which discusses these attractive, long-wearing Traffic Signs, and includes technical specifications and a complete price list, address:

Municipal Street Sign Co., Inc.
777-9 Meeker Ave.
Brooklyn 22, N. Y.

Machine Paints Curbs

Curbs can be painted quickly and conveniently at walking speeds with the new curb painting attachment now



available for all Line Markers manufactured by Universal Manufacturing & Sales Company, 5211 Pacific Boulevard, Huntington Park, California.

The new attachment is adjustable to all curb heights and widths. Shields protect surface of street and parkway lawns from paint spray. The regular spray gun and other Universal Line Marker controls are utilized by the new curb painting attachment to provide a simple, practical and economical time saving unit.

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REPLY:

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Institute of Traffic Engineers
Strathcona Hall
New Haven 11, Conn.

Secretary's Column

I do not believe that I have yet reported that some 16 of the 24 members residing in Texas submitted a petition to the last Board meeting for the authorization of a new Section. The Board took favorable action and the Texas Section, with Walt Klapproth, President; Gene Maier, Vice-President; and Bim (Maurice) Greer, Secretary-Treasurer, is very much in business. In authorizing the new Section, the Board released the State of Texas from the jurisdiction of the Southern Section, formed last Fall. Also, the State of Oklahoma, which the Southern Section had proposed to include within its jurisdiction, is to be retained by the Missouri Valley Section, in conformity with the recent ballot of two of the three members residing in Oklahoma.

The Southern Section held its first Annual Meeting in conjunction with the 15th Annual Southern Safety Conference in Louisville, Kentucky, in March. The Section's administrative year is to run from one Southern Conference (usually held in March) to the next when Annual Meetings will be held. Paul Ristroph, Karl Bevins and John Hanna were re-elected respectively, Prexy, Veep and Sec.-Treas. to serve until next March. Altogether, some 29 ITE members were seen at the Southern Section's first Annual Meeting which your Executive Secretary was privileged to attend.

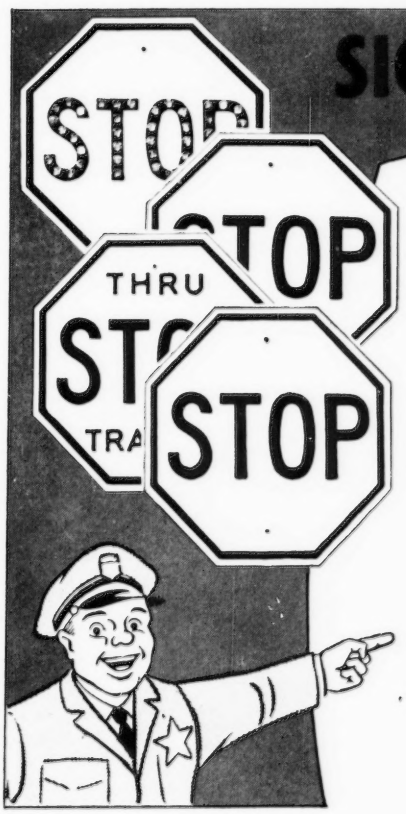
The Buffalo members who put on the last national ITE Meeting, upon finding themselves left with a small surplus after paying the final Convention expenses, recently donated a very handsome steel desk, surface equipment and matching chair for the Executive Secretary's use in the Headquarters office. A small appropriate plate outlining the Buffalo Committee's generosity has been attached. The Buffalo members are retaining the balance of their surplus as a potential nest egg for the new Buffalo-Ontario Local Section they are considering forming.

At the invitation of the Michigan Section, the Board of Direction has scheduled its next meeting for the Dearborn Inn, Detroit, Michigan, June 17 and 18. The Board will join the Michigan Section in the 1954 edition of its long famed annual summer outings to be held on June 19th. The Board meeting will follow the meeting of the Highway Research Board's Department of Traffic and Operations at the Hotel LaSalle in Chicago, June 15 and 16, as well as the ITE Technical Council meeting at the Dearborn Inn, Detroit, June 16th. So your man Friday is looking forward to being rather busy during the third week of June.

TIM TODD

Obituary

It is with regret that we announce the passing of F. M. "Nick" Carter (Mem., ITE) on May 1, 1954, in Ashland, Oregon. "Nick," at the time of his death, was the Assistant Traffic Engineer, State Division of Highways, Sacramento, California. He was 68 years of age.



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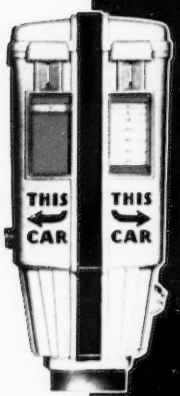

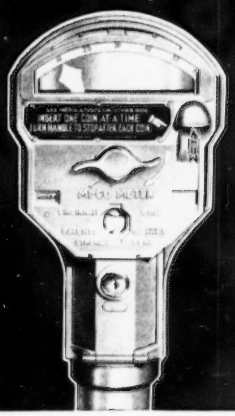

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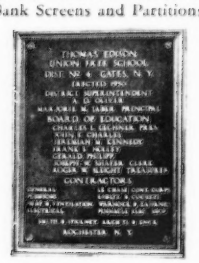

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For detailed information and prices at no obligation to you, write directly to the manufacturers or check the desired numbers and mail to: Shopping Center, TRAFFIC ENGINEERING, Strathcona Hall, New Haven 11, Conn.

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The twentieth edition of The Travelers highway safety booklet is the work of many hands. This booklet published annually since 1931, is distributed free in the interest of street and highway safety. Single copies or quantities may be obtained from:

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Any type of traffic obstacle should be properly illuminated. The BENJAMIN ELECTRIC COMPANY will be glad to help you when it comes to lighting design and equipment information. If you are responsible for safety island signals, supporting columns in streets, signs mounted on traffic obstacles, or safety island loading zones, be sure to contact BENJAMIN for complete service:

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Rubber traffic signs are flexible. Wheels can pass right over it, with not a bump, and no "feel" to the steering wheel. The good quality, strong and live rubber stays flexible. "Sure Stop" signs will take it. A portable base for Sure Stop signs makes it easy to use. Made of light-weight aluminum, it can be anchored wherever desired. A durable, test-proven base, Sure Stop signs are easy to install. Write for information about the many advantages.

SURE-STOP TRAFFIC SIGN COMPANY, INC.
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62. New Bracket Catalog for Outdoor Lighting Equipment Buyers

Anyone responsible for purchasing equipment for street lighting, or other outdoor lighting, will find valuable information in the new STEEL BRACKET AND MAST ARM CATALOG No. 82 just announced by THE UNION METAL MANUFACTURING CO., Canton, Ohio.

This fully illustrated catalog, the most complete of its type ever produced, contains design photos, drawings and helpful data covering all standard Union Metal lighting pole brackets, mast arms and accessory attachments. Also included are detailed specifications of construction, and mounting instructions for both wood and steel pole installations.

A copy of Catalog No. 82 can be obtained by writing to

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Selecting the most effective sign for a specific traffic problem is half the solution . . . and Lyle, headquarters for official traffic signs (and custom-built signs, too) can help with professional guidance. The rest of the problem is simple . . . order your signs from Lyle. Write today for complete catalog covering all sign needs.

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65. Planning the Modern Parking Facility

Ramp Buildings Corporation has this brochure for you, giving you an outline of the problems involved in planning the modern parking facility, and describing how Ramp Buildings Corporation Planning Services may be applied to such problems.

Nationwide application has proved RBC Planning Service to be comprehensive, cooperative and economical. For a description of the subject matter and scope of services offered by RBC, write for their brochure:

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Wherever it is necessary for groups of pedestrians, at given times, to cross traffic, the Eagle pedestrian Actuated Controller will speed up pedestrian crossing with safety and reduce traffic tie up . . . holding traffic only while pedestrians are crossing. All arrangements and signal sequences are available for problems at mid-block locations and intersections. Write for Bulletin E70.

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The new white on red 24" x 24" Stop Sign fully reflectorized . $5.85 each (26 or more).

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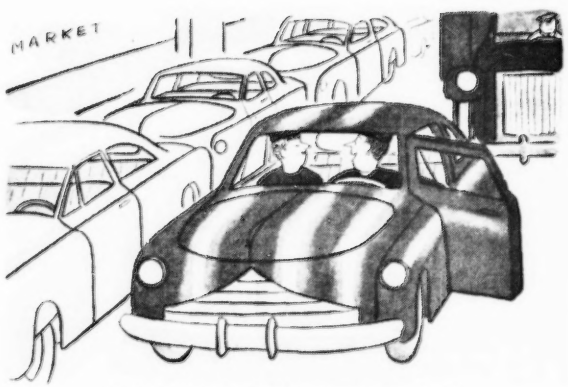

"Won't take me more than a minute, Alice."

". . . . . when along came this nasty truck."

Courtesy Travelers Insurance Co.

ONLY FIVE MORE MONTHS TILL . . .

What? . . . The 25th Annual Meeting of . . .
Who? . . . The Institute of Traffic Engineers
Where? . . . Kansas City, Missouri from . . .
When? . . . September 27-30, because . . .
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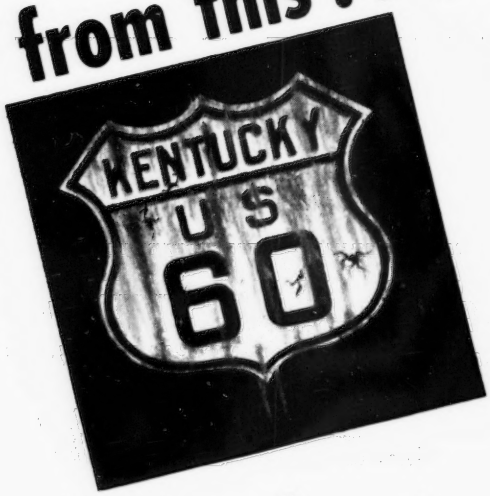

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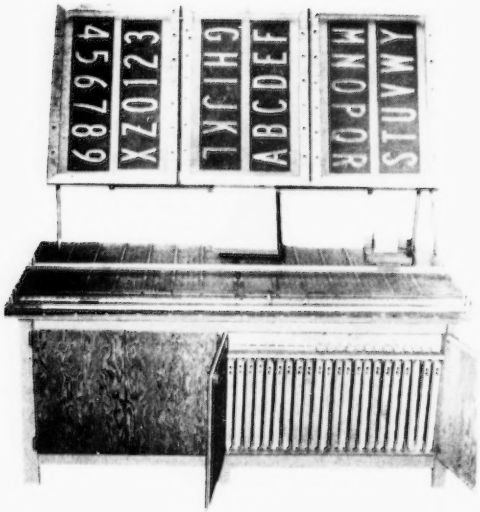

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